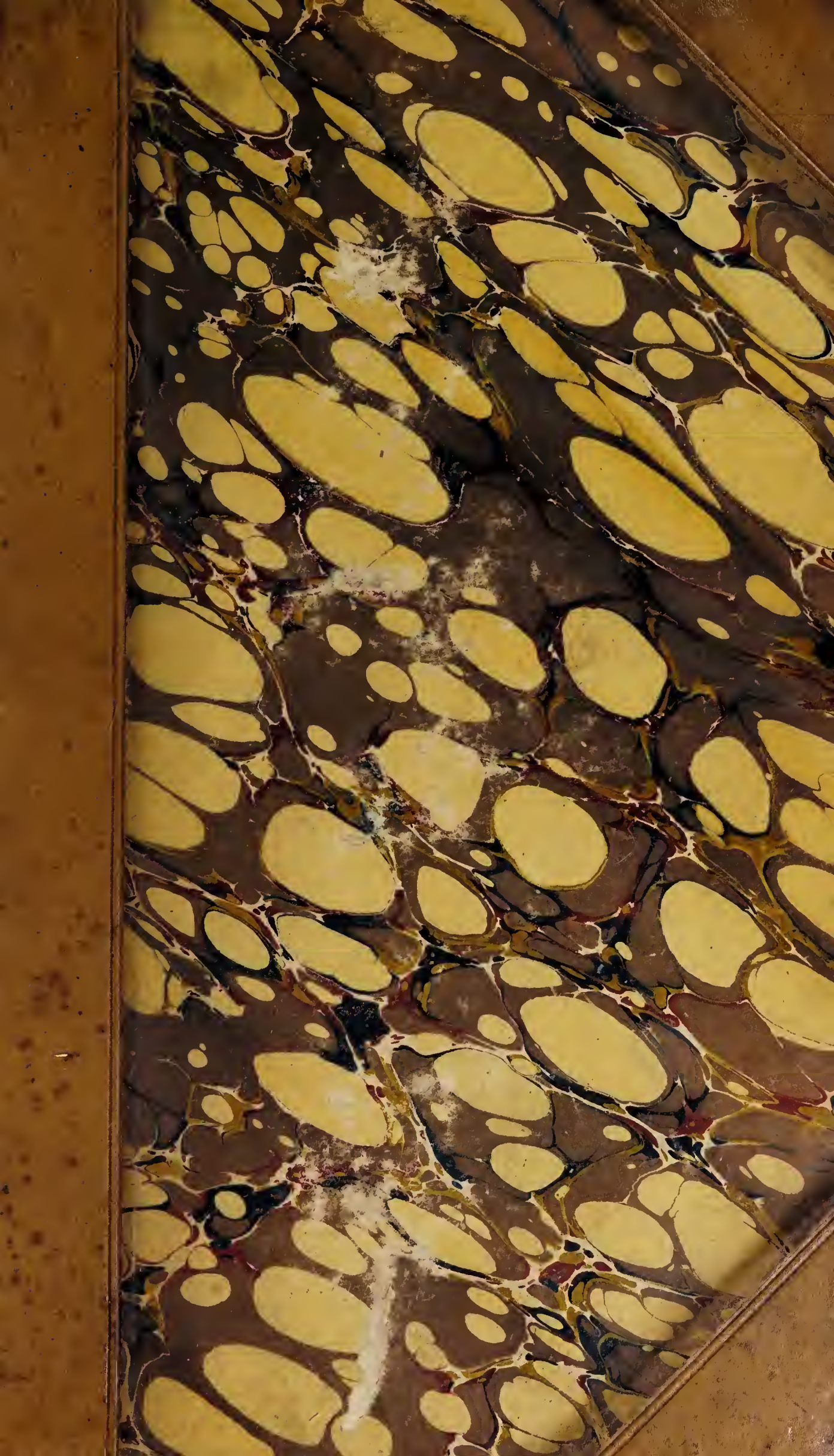

# TRANSACTIONS.

# TRANSACTIONS

OF THE

# ARCHITECTURAL INSTITUTE OF SCOTLAND.

SECOND SESSION.

1851-52.

VOLUME SECOND.

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## No. I.

# INTRODUCTORY ADDRESS

BY

THE VERY REV. E. B. RAMSAY, F.R.S.E.

[*Read at the Annual General Meeting of the Institute on 27th November* 1851.]

GENTLEMEN,

I WISH it had fallen to the lot of a chairman for this evening more competent to the duty of opening the Second Session of our Architectural Institute. But although I feel my deficiencies in point of skill, experience, and scientific knowledge, I do *not* feel disposed to yield to any member of the Institute in the interest which I take in its success, or in my desire and wish to advance the cause for which it has been undertaken. And I am proud and happy to have the opportunity of congratulating the Members from the chair on the first meeting of the Second Session. I use the word *congratulate* advisedly, for when we consider the difficulties which were to be overcome,—when we consider the distinguished names whom we failed to enrol as members,—when we recal the number and the characters of those whom we *have* enrolled, with the respectable array of nineteen candidates for admission this

evening,—the attendance at the meetings,—the papers which have been produced, and the general interest excited, we may really congratulate ourselves upon the success of the undertaking, and look forward to a permanent, useful, and distinguished Architectural Association,—not forgetting what we owe to our respected and indefatigable Secretary, and to those gentlemen who laboured with him in getting over the obstacles which were opposed to the accomplishment of this scheme. We must not, however, remit our exertions. An undertaking of this kind cannot be matured and rendered effective without constant efforts, and without a zealous co-operation of all the members.

The Papers of last session were satisfactory, and embraced that variety of topics which one wished to see brought to bear upon architecture and architectural subjects. But a wide field is still open. We desiderate papers on Scottish Cathedrals and Baronial Architecture, on our Abbeys and Churches. The fine arts, theory of colouring, archæology, ecclesiastical usages, historic dates, and reminiscences, all merge into the study of that noble art, for the promotion of which, in its most correct forms, and for a knowledge of which, in its purest development, we are joined into an Association. On these grounds, I am still of opinion that an Association like the present should embrace as wide a range of members as possible. It is not advisable that it should be composed exclusively of professional and working Architects, although we look to them, of course, for the staple material of the whole business. *Non*-professional Architects should coöperate with professional. The object of such an association is to diffuse a taste and knowledge of the science, and to make it spread its influence throughout intelligent and tasteful minds, as well as to bring forward the lucubrations of those whose lives are

devoted to the study. It is for those who employ Architects, as well as for Architects themselves. For this purpose a degree of sound and accurate knowledge of the building art should be gained by every one. Its principles should be understood, and something of its history be known. I was so much impressed with the importance of this acquisition, that in the second paper which was read last Session, *i. e.*, the first paper after Dr Grant's Introductory Address, I ventured to draw out a sketch or slight outline of an architectural course of study fitted for all inquirers, marking some leading features to be noticed in the various sections of the great subject—the different branches or rather stages into which it might be classed—commencing with the pure Grecian art with its three orders, passing on to the Roman with its five, then marking the effects of the combination of orders, raising one upon another, with the vast revolution effected by the introduction of the ARCH; the Palladian style, with its faults and advantages; taking then the ecclesiastical features of the art in its two developments, the Romanesque and Norman; out of Norman watching the growth of Gothic, properly so called, going through distinct phases in forming those magnificent and lasting monuments of its glory, the cathedrals of France, Germany, Spain, and especially England, of which the Minsters and parish churches supply the most delightful subjects for inquiry, study, and admiration—shewing the point of decay—the turning of its purity, and tracing the evil to its lowest point of degradation—marking the extraordinary *revival* of the art in our own times, of which there are many splendid examples—examples not unworthy of the times of the best of the Edwards and Henrys. I wished practically to show the nature of the field over which the student had to pass—to define objects—to mark out the ground; and it is

not from any motive of vanity (of which, however, I should not as an amateur feel any shame) that I mention the fact of that paper having been copied into the *Builder*, but because it encourages me in the hope that it may be of use. The *Builder* is eminently a *practical* work.

I have already said that non-professional admirers of the architectural science may coöperate with the Architect, and much assistance may be derived by the scientific builder from the taste and general knowledge and picturesque eye of the friends for whom he has to furnish designs. Take, for example, the instance of *effect* in buildings. This is altogether different from the merely technical and scientific skill of the builder. He may derive many useful hints from non-professional minds, and, perhaps, many mistakes have been committed by scientific and able architects not sufficiently considering these effects, or being obliged to supply designs where the proper effects were not produced, and which they knew would not be produced. By effect, I mean the impression produced on the mind by the various circumstances and associations which are connected with a building. Effects follow from viewing a building in one place which we lose when the same building is placed under other circumstances. If I find a parish church standing in its ancient churchyard, and, on examining its details, have proof of its Norman period, the sense of its venerable character, its 700 years, and historical reminiscences and associations, give it a great charm in my eyes, and I cannot separate the *results* of these circumstances from the building itself. I find a charm and fitness in the edifice derived from other sources beyond and besides those of its architectural details or proportions. If I find that the architecture, though Norman in style, is recent in construction, I lose much of this interest connected with the

subject. Still it is pleasing and congruous. It is fitting as a *restoration* of what *might* have been there before, and it is a repetition of forms which I know to be, in such positions, in harmony with all church feelings, and to be in fact right in its effects. But if I find the details of a building strictly Norman, and yet in such a position as precludes the possibility of its being connected with the Norman period, then, however accurate and skilful may be the details themselves, one great source of fitness has been lost. The effects are broken and inharmonious, and one cannot help feeling that some other style, with less exclusive associations, had been adopted. So, again, with pure Grecian building. Setting aside effects of association, how much depends upon *site* or position. I doubt the propriety of ever using pure Grecian work where the contemplative observer is not generally from a point *below* the level of the basement. The peculiar effects seem quite gone whenever we look down upon roofs and pillars foreshortened into themselves. Position should be well considered before the Grecian Portico and Temple are used. I am well aware of the difficulties in the way of Architects, in regard to setting down buildings in towns and in streets, and amidst most *un*architectural effects; and I am also aware of the zeal in some minds on the subject of classical models, who are always anxious to put them down everywhere, whether the Architect approve or not. But I think the subject requires much consideration, in reference not to the mere building, but to the fitness for the place. I think I may mention, without impropriety, the fine example we have in this city of the Grecian Temple uniting both purpose and position. The High School on the Calton Hill is a most successful adaptation, and I feel assured that no one who has observed the effects from the many different points *below* the base can have arrived at a different opinion.

I have heard the same approval from many competent judges; and the late Mr Alison, author of the Essay on Taste, (no mean authority) frequently has in my hearing spoken of the effect in terms of great admiration.

I do not know a more beautiful description of the true effects of the Grecian Temple than that which occurs in the Fourth Canto of Lord Byron's Childe Harold. The whole scene is exquisite, and exquisitely described; but perhaps the most effective touch in the whole picture is the introduction of the Architecture, which is there of such a style that it has there eminently its right place. I refer to the well-known passage, in which, after a beautiful description of

> 'Clitumnus, in its sweetest wave,
> Of the most living crystal that was e'er
> The haunt of river nymph,' . . . .

he then introduces the Architectural feature with great skill and effect—

> 'And on thy happy shore a *Temple* still,
> Of small and delicate proportions, keeps,
> Upon a mild declivity of hill,
> Its memory of thee. . . . .

I am disposed to venture on an illustration of this local effect of the Grecian Temple style which occurs in a rude and humble form in the neighbourhood. On going by the Queensferry road, after passing the little village or hamlet of Blackhall, you see from the hill which next occurs on the road to Cramond, a woody bank which fronts the north, and which forms part of the Ravelston grounds. At the foot winds a small stream, and the outline of the woody bank is broken, and has a pleasant appearance from the road; but a character is

imparted to it conveying an effect something in accordance with the passage just read. In the centre of the hill is a seat or summer-house in the shape of a temple portico, of ordinary materials—apparently of wood—probably of rude and simple construction, and yet the locality imparts the effect which in an evening and clear sky is really picturesque. The same simple edifice in a field, or in the Cowgate, would be mere nothing. The position gives the association, and suggests the charm. Other circumstances, such as relative heights of surrounding buildings, might be named as producing important effects in Architecture, independent of the details of buildings themselves. But I refrain. I have said enough to illustrate my meaning, which is simply this: that many considerations besides the inherent beauty of an edifice should be brought to bear upon the choice of *style* in Architecture for any given place or position.

I had one word to add on what seems a legitimate and beneficial use of an institution like the present, and that is to illustrate local and national edifices, and to raise an interest in their preservation or restoration. It is astonishing how much has been done in this way by Architectural Associations. The Round Church at Cambridge was restored under the auspices of the Cambridge Camden Society. A great deal has been done to the fine old Church or once Cathedral of Dorchester by the Oxford Architectural Society; and I heard only the other day that, under the auspices and exertions of a similar institution, £60,000 had been raised for the repair and restoration of the finest parish church in England—St Mary Redcliffe, Bristol.

To take the case of the *useful* in Architecture, attention has been called, amongst other subjects, to *Cottage* building, as well as to Palaces and Churches. The benevolence of

great English landlords have thus been called forth architecturally for the good of their people. The Duke of Northumberland, it is said, has pledged himself to rebuild a thousand cottages. There are numerous cases where the influence and skill and taste and enthusiasm of the public have been brought to bear, through the leaven of these societies, upon Architectural subjects ; and one very interesting use may be made of such institutions. The members frequently in England pay visits to places in the neighbourhood, or within the bounds included by their field of operations, and hear lectures delivered on the spot, pointing out to those present the very building itself, and there marking peculiarities of structure and of detail which are usually described in papers read by fireside and gas light many miles distant from the object described. We have not in this country the same motives and the same facilities for such excursions as they have in England, where, within twenty miles of any principal town, specimens of Architecture, Ecclesiastical and Baronial, usually abound, numerous and interesting. Still, however, many charming excursions might be made from Edinburgh of this kind,—one or two members having 'got up' the subject to be visited, and prepared to explain and point out the leading features to their attendant and listening brethren.

The very curious church at Dalmeny might afford the subject for an excellent lecture on Norman ecclesiastical Architecture. The border buildings are full of interest. Melrose, Dryburgh, Jedburgh, Kelso, and other places, might be visited for such purposes. More distant flights might be taken to St Andrews, Arbroath, Elgin ; and the enthusiasm of some of our members will, I hope, in summer carry a batch of them over, as architects, draughtsmen, antiquarians, historians, to Orkney, where it is said very curious and hitherto little noticed architectural remains are to be found. Indeed I believe

many persons have been much surprised at the opinions of Orkney buildings given in that really excellent work of Billings and Burn on Scottish edifices. Railroads have much facilitated such excursions, bringing those which lie at moderate distances within the limits of the day to go and return. Take, for example, the rich and beautiful ruins of Melrose. As the season advances it really would be a most interesting architectural visit. Facilities would doubtless be afforded for conveying and bringing back the whole body of the Scottish Architectural Institute. Railway directors are men, after all, subject to the feelings, passions, and tastes of mortal men, and we might then, amongst the ruins of Melrose, have some accomplished architectural antiquarian brother expatiating upon the precious remains, pointing out their peculiarities with the learning and the enthusiasm of a Dr Dryasdust or Laird of Monkbarns to willing hearers, who would themselves call out each others ideas by friendly converse, or sometimes by not unfriendly controversy.

And what Scotsman would not on such an occasion warm with the thoughts of the past history of his country; of her line of departed monarchs; and of her struggles for independence against the inroads of a powerful and ambitious neighbour. Nor could he contemplate the ruins of that once stately pile without deep and tender thoughts of that amiable and gifted spirit whose genius has shed over them a bright and lasting association, as he has done over many a Scottish locality, tower, and ruined abbey; and he could almost fancy that the spirit of him who sleeps within the precincts of the neighbouring Dryburgh would be observant of a visit paid by a band of countrymen to his own Melrose, associated as an architectural brotherhood, coming expressly that they might recal scenes of their country's history and vicissitudes in which it was *his* delight to live; coming to mark the indica-

tions of what Scotland once possessed of ecclesiastical wealth and pomp of worship—of ecclesiastical architectural magnificence.

As an example of what may be done by the local operations of a society, I have presented to the infant library a copy of the Somersetshire Archæological and Natural History Society. There are descriptions of *visits* paid by the association to local interesting buildings, and one great advantage of such united effort seems to be this : Not only do they call forth a general interest and attention towards Architecture, but they concentrate that interest and attention upon some favourite object in the neighbourhood ; and we have papers from men who have studied their subject under personal inspection and local enthusiasm for many years, all their lives it may be. Thus, for instance, in the volume which I have the honour of laying on the table are papers on Wells Cathedral, Glastonbury Abbey, St Mary's, Taunton, and other places, by members who have for years been familiar with them, and lived near them ; and it is not unimportant to observe, that in some cases those excursions not only gratified the architectural tastes and feelings of the members, but that they called forth old English *hospitable* propensities of the brethren in the neighbourhood, who abundantly provided those refreshments for the body, which are required by archæologists as well as by ordinary mortals, and which are specially grateful after a long day's labour amongst churches and castles, and the remains of ruined abbeys and monastic institutions.

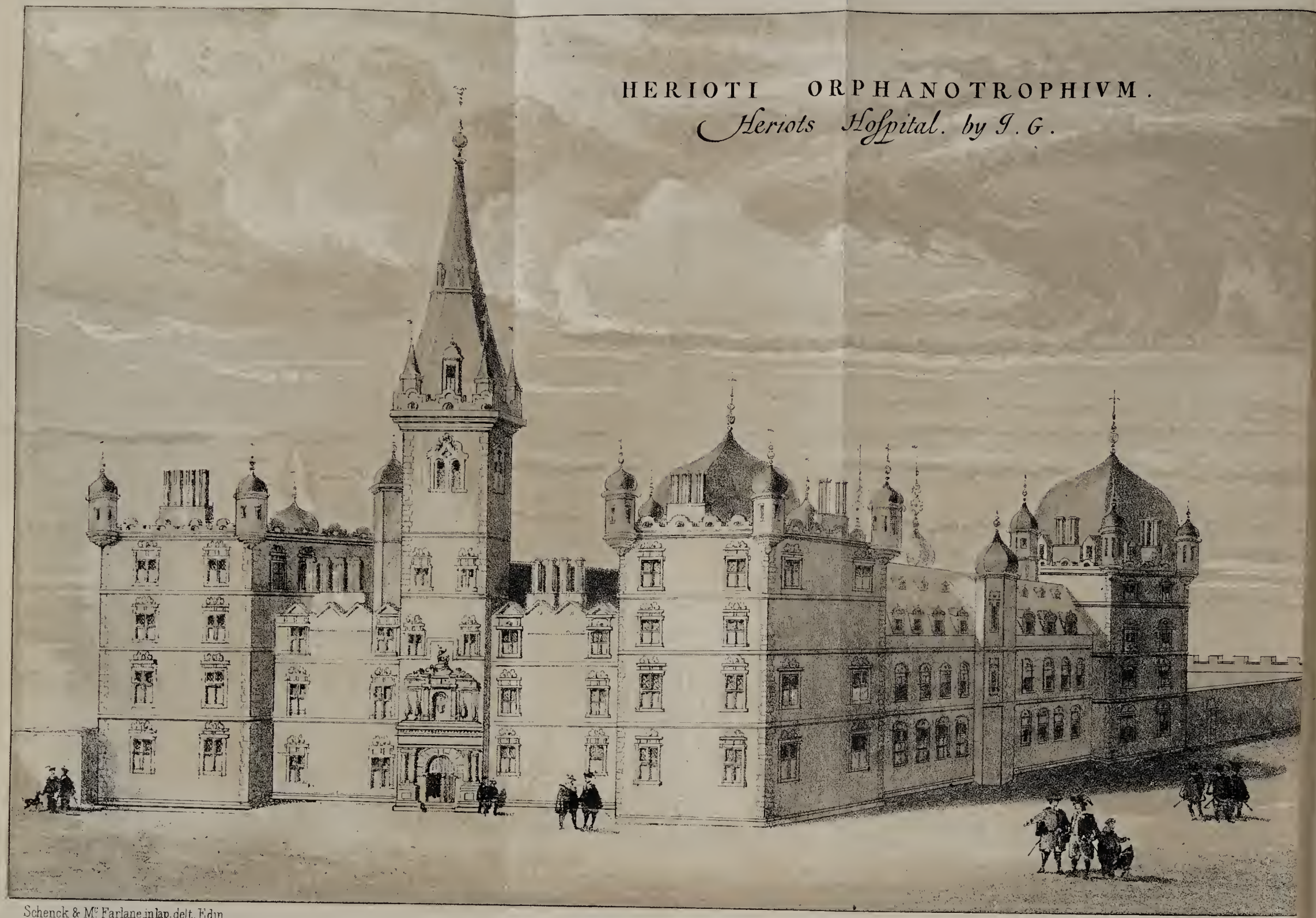
One word upon the proposed Library, and I have done. From the commencement of the undertaking I have been convinced of the absolute necessity of such a possession. Money may perhaps ere long be forthcoming to purchase books ; but, in the meantime, it is wise to begin a collection of donations.

Many useful and appropriate volumes may find their way into the library, and we certainly should feel encouraged by what has already been contributed in the very respectable list of volumes laid upon the table. It requires some resolution to give away books. Some people have a particular dislike to *lend* them, and certainly, for a person curious in books, and fond of his own, it is very provoking for the lender to forget who has had them, and still worse for the borrower to forget and not return them. There is more satisfaction in *giving* them than to incur such a risk; and, in fact, it is a very satisfactory disposition of books, on any particular art or science, that they should be deposited in the collection of an Institute, constituted for the advancement of that art or science. There they are at hand for consultation. Such books for ordinary students are certainly rather works for consultation than frequent perusal. I have had for some years a set of Britton's English Cathedrals, a valuable work, especially the later volumes; but whether I can muster resolution to present *them* I am not prepared to say. One curious archæological architectural work I have given, Whittaker's History of the Ancient Cathedral of Cornwall, of which there is this peculiarity—it is the history of a cathedral which does not exist; the site of its erection is unknown, and indeed of the very existence of which (at St Germains, as he supposes) there is no visible trace whatever in the present day. Upon such uncertain data it is evident the learned writer must have built much extraneous matter to produce two respectable quarto volumes. It is in fact an elaborate and erudite collection of ecclesiastical antiquities and architectural history—a valuable mine, from which many later writers have dug out much of their information. He is exceedingly intolerant of the opinions of others, conceited in regard to his own. His conclusions are to be received with caution, but he has brought

to bear upon ecclesiastical antiquities a great mass of learned authority, and points out the chief sources for information.

Gentlemen, I have done. I do sincerely apologise, and crave your indulgence for the remarks which I have offered.

The business of our Second Session will now commence.

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Transactions of the Architectural Institute of Scotland.
Second Session 1851-52.

## No. II.

# WHO WAS THE ARCHITECT OF HERIOT'S HOSPITAL?

BY

DAVID LAING, Esq.,

TREASURER TO THE SOCIETY OF ANTIQUARIES OF SCOTLAND.

[*Read at the Meeting of the Institute in Edinburgh on 27th November* 1851.]

In a report made to the Society of Antiquaries on the 9th of December last, in reference to some localities in East Lothian which were visited during the autumn recess, I took occasion to consider the above question with some minuteness. The digression was suggested in noticing the old baronial mansion of Wintoun, in the parish of Tranent. As the question possesses some local interest, I have since availed myself of an opportunity, through the kindness of the Rev. Dr Steven, the historian of the Hospital, to examine the minutes of the Governors and accounts of the Treasurers of this noble Institution, with the purpose of printing some copies of the communication to which I have referred. Understanding however that the subject has been brought under the notice of the Architectural Institute, I beg leave to take this opportunity

of submitting the following remarks, to be placed at their disposal, should they be deemed worthy of publication.

## 1.—DR BALCANQUALL.

In looking into the earlier printed travels or descriptions of Edinburgh in which mention is made of Heriot's Hospital, the credit of having designed the building is attributed to his chief executor, Dr Walter Balcanquall, Dean of Rochester, and afterwards of Durham. Even Maitland, the historian of Edinburgh, in his details respecting this institution, mistaking the obvious interpretation of the words 'pattern' and 'prescript' as applied to the Hospital itself, and not to the mere building or frame-work, says, the Council 'having 'prepared materials for the intended work, laid the foun-'dation of the present magnificent structure on the 1st of 'July in the year 1628, *according to a plan of the said* '*Balcanquall.*' (P. 440.) In a previous work by Captain J. Macky, entitled 'A Journey through Scotland,' printed in 1729, he mentions 'the most celebrated Hospital of 'George Heriot,' and adds, 'the building exceeds anything 'of the kind in Europe . . . . . *which I suppose* '*is owing to Dr Balcanqual, his executor, who was a great* '*Architect*, was Dean of Rochester, and helped King James 'the Sixth to write his *Basilicon Doron*, and was left in full 'power by Mr Herriot to build this Hospital; which he hath 'done more like a princely palace than a habitation for 'necessitous children.' Similar statements are repeated in somewhat more vague terms in other works of that period; but we may safely conclude that Dr Balcanquall had as little claim to the title of a great architect, and as much concern in furnishing the specific plans for building the Hospital as he

had in assisting his Royal master in the composition of a work which was actually printed in 1599, or ten years before the Doctor had completed his education in the University of Edinburgh.

## 2.—INIGO JONES.

That Dr Balcanquall was the chief person in carrying into effect the founder's intention is sufficiently ascertained; and it appears from the Minutes of Council in June 1627 that the Governors had resolved that the Hospital should '*be* '*buildit, conforme to the pattern of the same, given by the* '*said Dean of Rochester.*'* From this it has been surmised that the design for the building was furnished to him by the celebrated English architect, Inigo Jones. There is however no evidence to warrant this supposition, which seems to have no older authority to rest upon than Hugo Arnot in his History of Edinburgh, first published in 1779, who says, (p. 566), 'The Governors began to raise this 'magnificent fabrick, called Heriot's Hospital, in July 1628, '*according to a plan of Inigo Jones, as is reported,*' &c. And now for a period of eighty years this supposition has generally been assumed as an established fact; and even on the faith of this, from a general resemblance in the principal court of the Palace of Frederiksborg, in Zealand, built by Christian the Fourth, the building itself has been attributed to Jones,† although he probably never set his foot either in Scotland or in Denmark. This tradition, therefore, may be considered as proceeding upon the principle which ascribes to a well-known name so many old

* See Appendix to this Paper, No. II.

† Denmark Delineated, by A. Andersen Feldborg, p. 88. I fear I must plead guilty in having partly led the author of that work to come to such a conclusion.

portraits of the sixteenth century to Hans Holbein, and of the following century to Vandyke, even of individuals whom they could never have seen.

Had the plans for building the Hospital been furnished by the great English architect, we may certainly conclude that some notice of the fact would have appeared in the records of the Town-Council, or in the minute accounts of expenses rendered from year to year by the Treasurer, and regularly attested by the Ministers and Magistrates of Edinburgh. Nor, in the published works of Inigo Jones, or among his original drawings and sketches preserved at Oxford, or in the Duke of Devonshire's possession, can any trace be discovered of his having furnished such plans.

## 3.—WILLIAM WALLACE.

The great resemblance in the plan, the style of building, and the internal decorations of Wintoun House to Heriot's Hospital has often been remarked, and indeed is much too striking to be overlooked by any visitor. A considerable portion of the exterior is unfortunately concealed by the modern additions, which, while they add to the comfort and conveniences of the house, have most materially injured the peculiar character of the original building.* The house itself was erected by George, sixth Earl of Wintoun, most probably at the time of his second marriage in 1623. Whilst examining the voluminous record of confirmed testaments, I accidentally met with a notice which seemed to leave no doubt that it was designed and built by William Wallace, who then held the office of King's Master Mason for

* See the notices and views of Wintoun House, given by Mr Billings in his valuable and interesting work, 'The Baronial and Ecclesiastical Antiquities 'of Scotland.'

Scotland. As he was the person who actually built the original portion of Heriot's Hospital, it occurred to me to examine with some care the existing documents connected with this edifice, in the hope of being able to throw some light on the subject; and I am sure the members of the Society will not consider such a digression misplaced, as it has reference to one of the chief ornaments of our city.

Of the early history of Wallace we know nothing, and can only conjecture that he may have enjoyed an opportunity of improving his skill as an architect by foreign travel. His name occurs as a burgess of Edinburgh;* and he was, probably, the son of William Wallace, merchant tailor and burgess of Edinburgh, and related to Mr Robert Wallace, minister of Tranent. In a charter granted by the Free Masons of Scotland to William St Clair of Rosslyn, William Wallace signs as 'Deacon in the Lodge of Edinburgh.'† This office he held from 1626 to 1628; and, in the Treasurer's accounts, he is frequently styled 'the Deacon.' But he had previously distinguished himself, and had been employed in the reparation of his Majesty's Castle of Edinburgh and Palace of Holyrood, as set forth in the letter under the Privy Seal, dated at Edinburgh on the 18th of April 1617, appointing 'his lovit William Wallace, Scottisman,' to be 'his Hienes Principall Master Maissoun to all his Majesties 'Warkis within the realm of Scotland,' from the 1st day of May ensuing, with a monthly salary of £10.‡ That Wallace was employed by several of the nobility there is no reason to doubt; and the House of Wintoun, in the parish of Tranent,

* On the 21st of November 1621,—'William Wallace, Maister Maissone to 'his Majestie, compeirand sufficientlie airmit with ane corslet, is maid Burgess 'of this Burgh, and hes given his aith in maner above written, and hes payit 'for his dewtie to the Deyne of Gild, £66 : 13 : 4.'—*Register of Burgesses, &c.*

† The Laws and Constitutions of the Grand Lodge of Scotland, App. p. 126. Edinburgh, 1848, 4to.

‡ See Appendix, No. 1.

may have contributed, through the recommendation of Mr Robert Balcanquall, then minister of that parish, to his brother Dr Balcanquall, along with his established character, and the personal knowledge of his fellow-citizens in Edinburgh, to his being employed in the erection of the new Hospital.

In the 'Memoir of George Heriot,' by the Reverend Dr Steven, published in 1845, ample information is given respecting Heriot's settlement, the arrangement of his affairs between the executors and the Magistrates of Edinburgh, the purchase of the ground, formerly called the High Riggs, and selected with such good taste as the site of the building. The contract with Wallace as Master Mason is not preserved; but on the 1st of July 1628, it is recorded, by the Treasurer,—'In the name of God, we began to lay the ground-stane on 'ane Tyisday, efter the sermone; and I gave in drink-silver 'to the maister maissone and his companiones, at the found-'ing of the Wark, twa rosnobills,' or in Scottish money, £21 : 6 : 8.

For the purpose of making the necessary arrangements, and deciding upon 'the pattern' or constitution of the Hospital, and also in fixing the site of the proposed building, with other matters connected with Heriot's bequest, the Dean of Rochester visited his native city in June 1627. The following payments made to him at that time appear in the Treasurer's accounts:—

'*Item*, To Dr Balcanquall, in full of his Legacie, conform to his Dis-
'charge, Fyfftie Pounds Sterling; and being deliverit after the rait
'off England, the double Angill at xxijs., is.....£606 0 0
'*Item*, Mair to the said Doctor, conforme to an Act of
'Counsall, £100 Sterling, and is ..... 1212 0 0
[This sum was voted to Balcanquall as a gratuity, 'for
'his panes in setting downe the Statutes concerning

'George Heriote his Hospitell, and expenses disbursit
'in repairing to this Burgh, by and attour his legacie.'*]
'*Item*, To his thrie Servants, at command of the Provost
'and Baillives ..... 80 0 0'

Two other entries of payments may be copied, although they seem to have been purposely omitted in the duplicate account, attested on the 12th September 1627 by the Bailies and Ministers of Edinburgh :—

'*Item*, Spent in the tyme when Dr Balcanquall was heir, at sundrie
'occasiones, be command of the Provost and Baillives £409 16 8
'*Item*, Mair for the lain [loan] off pewter disches when
'the Doctor dyned with the Gud Town ..... 15 16 8

The first entry in the Treasurer's accounts of money paid 'upon the fabrick of the Hospital, and provision of materials 'thereto,' under the date 22d of January 1628, was given to William Wallace, deacon, 'for a long line for measuring the 'ground,' 20s. ; and to the wright, for making 'nyne score 'spelkis of timber (or splints of wood) to modell the ground, 'and for the timber itself,' 40s. Also, on the same day, 'to 'the Maister Mason and Maister Wright, and their servants, 'to drink when the ground was spelked,' £3 ; and the same sum, four days later, 'to drink at the levelling of the ground, 'when sindry of the Council were present.' The wages paid to Wallace were at the rate of £6 per week, or £1 per day, according as he attended at the work. After all the necessary preparations, the foundation-stone, as already mentioned, was laid on the 1st of July 1628.

In a letter addressed to the Governors, and dated on the 5th of October 1629, Dr Balcanquall, after expressing his satisfaction to hear of the good beginning of the work, and referring to the purpose of Charles the First to visit Scotland

* Records of the Hospital, vol. 1, p. 152, quoted by Dr Steven in his History, p. 56. See also Appendix No. II.

next year, he says, 'I hope the building shall be in that for-
'wardness as shall give testimonie to the many strangers who
'will look upon it, that we of our Nation can discharge the
'Trust for pious uses committed to us, as well as they use to
'doe it in this country. I doe therefoir humbly beseech you
'to encourage and spurre on your Thesaurer, and all uther
'officers belonging to that work, for the quick ripening
'of it, and bringing it to that perfection against his Ma-
'jesty's coming home, which may stand with all our credites.'
This letter (first printed by Dr Steven in his History) is important, not only as indicating that the building was then far advanced, but that the Dean's earnest wish was directed, not so much to the building itself, as to see carried into effect the great object for which the Hospital was designed. But the King's visit was delayed till 1633; and in the meanwhile the Master Mason died, leaving the work to be completed by other hands, and Dr Balcanquall seems never to have returned to Edinburgh to examine the building, or to have made any further inquiries respecting its progress.

William Wallace, Master Mason to his Majesty, and burgess of Edinburgh, died at the end of October 1631. His death must have been unexpected: it appears from the accounts of that month, that his attendance on the work was uninterrupted, as he received four weekly payments of £8 for himself and his boy, on the 1st, 8th, 15th, and 22d; and on the 29th, the entry is '*Item*, to William Wallace and his boy, five days and 'a half, £7 : 16 : 8,' in place of an entire week, or six days. He left several young children by his wife, Agnes Blackhall, probably the daughter of Andrew Blackhall, who, at the time of his death in 1609, had been minister of Inveresk for thirty-five years. In the confirmed testament and inventory of Wallace's effects,* the following item seems clearly to prove

* Register of Confirmed Testaments, 12th December 1632.

that he was the builder of Wintoun House, being an allowance granted to him for special services to the Earl of Wintoun.

'*Item*, Thair was awin to the said umquhill William Wallace be 'George, Earle of Wintoun, in acknowledgment of his panes in his 'Lordship's works, conforme to his Lordship's tiket, subscrivit with 'his hand, the sowme of 500 merkis; quhilk sowme of 500 merkis is 'upliftit sen the Defunctis deceas be Nicoll Udwart, baillie, and as yit 'is in his handis and custodie.'

'*Item*, Be his Majestie's Thesaurer for the Defunctis fees as Master 'Massone to his Majestie, and for his leveray clothes due, to be pait be 'his Majestie's Thesaurer and Ressaveris, the last of October 1631, '330 merkis.'

The office of Master Mason to his Majesty was conferred on John Mylne, 17th of December 1631; and that of Master Mason to Heriot's Hospital was given to William Aytoun junior, both appointments being on the same terms and conditions as Wallace enjoyed.

That Wallace is justly entitled to the credit of having furnished the plans, as well as of having executed a considerable portion of Heriot's Hospital, is proved, I think, by the following circumstances:—

1. On the 12th of August 1629, his receipt to the Treasurer for the sum of £100, awarded to him by order of the Governors, bears that it was '*for my bygone panes and extra-'ordinarie service* IN THE FRAME and building of the said 'Hospitall this year bygone.' The word *frame* is here evidently used for design or model.*

* FRAME, *n.s.* A fabrick; anything constructed of various parts of members.—*Johnson;* who, among his other quotations, has—

'Castles made of trees upon *frames* of timber, with turrets and arches.'—*Bacon.* 'This universal *frame.*'—*Milton.*

'The gate was adamant; eternal *frame,*
'Which, hew'd by Mars himself, from Indian quarries came,
'The labour of a god; and all along
'Tough iron plates were clench'd to make it strong.'—*Dryden.*

'We see this vast *frame* of the world.'—*Tillotson.*

2. In an application to the Governors for some aid to herself, his Widow, being left by the death of her husband 'with 'ane great burding of many young small babies,' says, 'It is 'not unknown to your Lordships what extraordinar panes 'and cair my said umquhill Spouse had and tuik upon the 'said wark thir diverse years bygone, and AT THE BEGINNING 'THAIROF, UPON THE MODELL AND FRAME THAIROF.' This was acknowledged by the Governors, who directed the Treasurer 'to pay to this Supplicant, to the use of hir bairns, 200 'merks, with the soume contenit in hir compt, and to ressave 'the muildis and drauchtis fra hir.'

3. After his death, the Governors, on the 21st of November 1631, in a special minute, authorizing the above payment, express the sense which they entertained of Wallace's services, 'by his extraordinar panes and great care he had in that 'work, BAITH BY HIS ADVYCE, and in the building of the 'same.' And,

4. In the contract with his successor as Master Mason, dated 5th December 1631 and 13th February 1632, William Aytoun was expressly enjoined 'to prosecute and follow forth 'THE MODELL, FRAME, AND BUILDING OF THE SAID WARK, as 'the same is already begun; and to devyse, plott, and sett 'down what he shall think meittest for the decorement of the 'said wark, and pattern thereof, already begun, where any 'defect beis' (may be) 'found.'

With such express statements, while the work was in progress, and the singularly close resemblance in the style and workmanship of another structure erected at that time by Wallace, it surely cannot be requisite to add one word more in support of his claims to be considered the Architect of Heriot's Hospital.

In case, however, the words of the minutes printed in the Appendix No. II should seem to convey a different meaning, it

may be proper to observe, that Heriot, in the codicil to his will, had given full and absolute power to Dr Balcanquall 'to treit 'and conclude with the Provost, Baillies, Ministeris, and Coun-'sell of the said Towne of Edinburgh, tuitching and concern-'ing the intendit Hospital;' that the site of the proposed buildings was altered on the same day that the general plan and constitution of the Hospital was determined; and having compiled the code of Statutes for its future government, that three weeks later, the same were formally approved and signed by the Governors. Or, should it still be asserted that the Dean prescribed the form and pattern of the building, would it not be as natural to conjecture that the specific plans were given to Balcanquall by the person who was actually employed in executing them, as by Inigo Jones, before the nature and site of the building had been considered by the Governors. That the Dean of Rochester himself had any architectural skill, to be able to have furnished such designs, is a mere gratuitous assumption. After all, in the mere quadrangular form of the building there is nothing so remarkable, except that the beauty of its details are so much in accordance with the general design; and Wallace's share in superintending and executing the chief portion of the building, cannot be disputed. For the history of the Hospital itself I must again refer to the curious and interesting volume* of my friend the Rev. Dr Steven.

In the Appendix to this paper will be added copies of some of the documents which I have quoted, with extracts from the Treasurer's accounts, to shew the progress actually made in the building during Wallace's life, and the sums occasionally paid to him and his assistants for their labours. These articles in the Appendix contain in fact the chief mate-

* Memoir of George Heriot; with the History of the Hospital founded by him in Edinburgh.—Edinb. 1845, 12mo.

rials for deciding upon the question, 'Who was the Architect 'of Heriot's Hospital?' If it should be thought that the matter has not been clearly established, there has at least been sufficient stated to shew that Wallace was no ordinary builder, but well entitled, for his skill in carving and elegance of design, to honourable distinction among the early Architects of Scotland.

About the year 1647, a view of the building, drawn by James Gordon, minister of Rothiemay, was one of four views of public buildings in Edinburgh, which were engraved in Holland. The print being very uncommon, the accompanying fac-simile has been made to illustrate this communication. It represents the Hospital as completed, with a handsome spire over the north entrance, and with large circular domes at the south-east and south-west towers. These domes, which were built by Aytoun, appear to have been removed by order of the Governors in July 1649. The spire having remained unfinished, probably from want of funds, Aytoun contracted in 1645 to build the steeple to the height of 22 feet above the 'Tabill as it now stands,' for the sum of 2400 marks. At a later period, to give it a more finished appearance, a small stunted cupola was added. As this sadly disfigures the building, it would be worthy of the Governors of the Hospital at the present day (and I hope their attention may be directed to the subject) to remove this cupola, and complete the spire, according to the original design, as exhibited in Gordon's delineation, as there can be no doubt that it would add materially to the beauty and effect of this justly admired edifice.

## APPENDIX TO No. II.

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### No. I.

LETTER in favour of WILLIAM WALLACE, as Master Mason to His Majesty King James.

Ane Letter maid, makand mentioun, That oure Souerane Lord understanding that his Hienes darrest Mother, of worthie memorie, maid and constitut umquhile John Roytell, Frenchman, principall Maister Maissoun to all his Hienes warkis concerning the aucupation during all the dayis of his lyfetyme, and gave and grantit to him ane certane fie for exercing of the said Office, and that be his deceis the said Office now vaikis in his Hienes handis: And his Maiestie, remembering the guid, trew, and thankfull service done to his Hienes be his lovit WILLIAM WALLACE, Scottisman, maissoun in his imployment, anent the reparatioun of his Maiesties Castell of Edinburgh and Palice of Halyrudhous and utheris his Maiesties warkis: And his Maiestie being willing that the said William continew in his said service, Thairfoir our said Souerane Lord, with advyse of the Lordis of his Hienes Privie Counsall, makand, constituand, and ordinand the said WILLIAM WALLACE his Hienes principall Maister Maissoun to all his Maiesties Maister warkis within this Realme of Scotland concerning his occupatioun during all the days of his lyftyme, Gevand to him the Office thairof, with all priviledge, fredomes, and commodities that thairto perteines: And for using thairof and attendance thairupon gevand, grantand, and disponand to the said William Wallace the soume of Ten pundis Scottis money in name of fie, to be payit monethlie to him during all the dayis off his lyftyme be his Maiesties Thesaurar and Comptrollar, Thesaurar and Comptrollar Deputtes and Under-Res-

saueris of his Maiesties rentis and casualities of the said Kingdome of Scotland, or ony of them present and that sall happin to be for the tyme; beginnand the first monethis payment thairof upone the first day of Maij nixt to cum, commanding heirfoir the saidis Thesaurar and Comptrollar, Thesaurar and Comptrollar Deputtes and Under-Ressaueris of his Maiesties rentis and casualities of the said Kingdome present and to cum to answer, obey, and mak thankfull payment to the said Williame Wallace off the said soume of Ten pundis money foirsaid, monethlie during his lyftyme. And the samen salbe thankfullie allouit to them in thair comptis of the Checker be the Auditouris thairof, quhome his Hienes charges in lyk maner to defais and allow to them, The said letter being anis producit upone compt, and registrat in the Rollis, as said is: becaus the said Williame Wallace, efter sufficient tryell tane be James Murray, his Maiesties Maister of Wark, anent the qualificatioun of the said Williame to use and exerce the said Office, he is fund habill and qualifeit to use and exerce the samen sufficientlie, &c. At Edinburgh, the auchtene day of Apryle the yeir of God J$^{m}$ vj$^{c}$. and sevintene yeiris.

*Per Signaturam.*

—*Registrum Secreti Sigilli*, lxxxv, *fol.* 302.

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## No. II.

### EXTRACTS from the MINUTES of the Governors of Heriot's Hospital.

Act for conferring with Doctor Balcanquell anent the Frame of the Hospitall.

*Sexto Junij J$^{m}$ vj$^{c}$ Vigesimo septimo.*

The quhilk day the Provest, Bailleis, Deyne of Gild, Thesaurer, Counsell, and Deacones of Craftis being convenit in Counsell, nominatis and electis to confer with Doctor Balcanquell, Deyne of Rotchester, anent the frame of the Hospitall to be foundit, conforme to George Heriot his Latter

Will and Testament, the Provost, Bailleis, Deyne of Gild, Theasurer; Maister Andro Ramsay, Mr Williame Strutheris, and Mr Thomas Sydserff, Ministeris; John Byris, Nicoll Vduart, Patrick Eleis, Archibald Tod, Thomas Quhyt, James Leslie, and Alexander Reid.

Act anent the Unfitnes of umquhile George Heriotis Tenementis for the Stance of the Hospitall, and for buying of sum uther commodious place for the same.

*Vigesimo secundo die Mensis Junij* 1627.

. . . . Lyik as also the said umquhile George Heriot, be ane Codicill annexed to the said Testament and Latter Will, earnestlie intreatted and desyred that Mr Doctor Balcanquell, now Deane of Rochester, sould, with all conveniencie, eftir his deceas, repair to this Brugh, Giveand unto him absolute power to treat and conclude with the Provest, Bailleis, Ministeris, and Counsell of this Brugh, concerning the said Hospitall, and to direct and ordour the same; and to sollicite the business in such manner that all thingis may be done and performit in everie respect according to the trew meaning of the Testator; as at mair length in the said Codicill of the daite the twentie-ane of Januar 1623 yeiris *Stilo Anglicano,* is conteyned: And that now the said Mr Doctor Balcanquall, Deane of Rochester, haveing repairit to this Brugh for performing of his pairt and dewtie requyrit of him be the said Codicill, and haveing enterit in deliberatioun with the saids Provest, Bailleis, Ministeris, and ordinarie Counsell of the said brugh, anent the stance and seate of the said Hospitall, and vewed the foirsaids tenementis mortefeit be the said umquhile George to that effect, They all, in ane voyce, fynds not onlie the saids tenements and bounds of the same ar uncapable of so great a work, but also that the same lands ar for the maist pairt ruinowes; and thairfore, that the downe taking of the same and redding of the ground wilbe moire expensive, and will expend graiter sowmes of money then will acquyre ane far lairger and comodious parcell of ground for setting and mak-

ing of ane Stance to the said Hospitall, and making of orcheards, gairdenis, and walkis fitt for the same. And thairfoire, they all, in ane voyce, aggrie and condiscend that sum comodious and fit place be bocht for the use of the said Hospitall, and Situation thairof; and that the rentis of the said tenementis remane with the same Hospitall, or uthairwayes that the same be sauld, and the moneyes gotten for the same be convertit to the use thairof.

Act for the buying of Sex aikeris of land from the Towne Thesaurer, and Situatting and Building of the Hospitall thairin; and Nicoll Udwart electit Theasurer thairof.

*The samyn day.*

Forsameikle as the Provest, Bailleis, Ministeris, and Counsell of this Brugh, and Mr Doctor Balcanquell, Deane of Rochester, hes, eftir mature deliberatioun and guid advysement, tryit and found that the parcell of ground, contening ten aikeris of land, laitlie acquyrit be the guid Towne from Sir George Touris of Innerleyth, knight, and thairaftir invironit with ane wall, and incorporat with the rest of the said Brugh, and haldin of his Majestie in frie burgage as pairtis and pendicles of the said Brugh, and with the same liberties and priviledges, is the most fit, commodious, spacious, and pleasant ground for Situatioun of ane Hospitall,—Thairfore, they aggrie and condiscend, that Sex aikeris of the same, or thairaboutis, be bocht from the Theasurer of the guid Towne, for the use of the Hospitall appoynted to be foundit be umquhile George Heriot, Jewellore to his Majestie; and that the same be Situat thairin, and Buildit, conforme to the paterne of the same given be the said Deane of Rochester to the Provest, Bailleis, Ministeris, and Counsell of the said Brugh; and ordanes the said wark to be gone in hand with all expeditioun, and that all materiallis be bocht in dew seasone, to the effect that they may begyne to bige and build upone the fyifteine day of Merche next and all to be done conforme to the paterne and prescript maid be the said Deane of Rotchester,

with advyce of the saids Provest, Bailleis, Ministeris, and Counsell: And for the better effectuating thairof, the saids Provest, Bailleis, Ministeris, and Counsell hes nominated and elected Nicoll Uduart, merchand, Thesaurer to the said wark till Michaelmes nixt, and farder, to continow during thair pleasour. And farder, they have ordayned and aggreit that the said Hospitall salbe buildit upone the rent of the moneyis, landis, and tenementis pertening to the said Hospitall; and that the samyn thaireftir may be convertit to the use of the said Hospitall, in manner contenit in the said latter will.

### Gratuitie, Doctor Balcanquall.

*Quarto die Mensis Julij, Anno Domini* 1627.

The same day, Ordanes the Provest and Bailleis to caus giv ane gratuitie to Doctor Balcanquell for his panes taken in setting downe the Statutes concerning George Heriote his Hospitall, and expenses debursit in repairing to this Burgh, by and attour his Legacie. And ordanes the Thesaurer to caus pay the same, and the same sal be allowit in his comptis.

### Precept, Thesaurer, for frauchting of ane Ship.

*Decimo tertio die Mensis Julij, Anno Domini* 1627.

The quhilk day, David Aikenhead of Kilquhise, Provest, &c. . . . . Ordanes Nicoll Udwart, Thesaurer of George Heriotis Hospitall, to fraucht ane Ship to bring home jeasting and uther commodious tymber for thair Wark.

### Act anent the productione of the Statutis following, to the Counsell.

*Decimo tertio die Mensis Julij, Anno Domini* 1627.

The quhilk day, David Aikenhead of Kilquhise, Provost, &c. . . . . being convenit in the efternone in the

Counsell-hous, as Feoffis in trust, guyderis and governouris of the Hospitall to be fundit within this Brugh, to be callit George Heriot his Hospitall, compeirit Doctor Balcanquall, Deane of Rotchester, and for fulfilling of the trust reposed in him be umquhile George Heriot, &c., producit the Buik of Statutis underwritten, subscryvit with his hand, and seallit with his seale; Willing, &c.

### Precept, Thesaurer, Bannatyne.

*Vigesimo primo die Mensis Januarij* 1628.

The quhilk day, &c., Ordanes the Thesaurer to pay to James Bannatyne for his panes taken in bringing hame the tymber from Gottinberrie, ane hundreth merkis, and the same sal be allowit to him in his comptis.

### Precepts, Thesaurer, Wallace.

*Tertio die Mensis Augusti, Anno* 1629.

The samyn day, Ordanes the Thesaurer to content and pay to William Wallace, Maister Maissone and Maister of Wark to the Hospitall of umquhile George Heriot, for his bygane panes and extraordinar service done in the frame and building of the said Wark this yeir bygane, the sowme of Ane hundreth pund, and the same sal be allowit to him in his comptis: And in tyme to cum, as he deserves, promittis to considder him.

*Vigesimo Septimo die Mensis Septembris, Anno Domini* 1630.

The samyn day, &c., Ordanes Nicoll Udwart, Thesaurer, to content and pay to William Wallace, Maister Maisone, Maister of Wark to the Hospitall of umquhile George Heriot, to encourage the said William to attend the better upon the said Wark, and to be the more fordwart thairin, and in gratuitie for his extraordiner panes taken be him upon the said Wark in tymes bygane, the sume of Ane hundreth merkis money, and the same sal be allowit to him in his comptis.

*Vndecimo die Mensis Octobris, Anno Domini* 1630.

The same day, &c., Forsamekle as the Counsell, upone the 27 of September last, granted to William Wallace, Maister of Wark, for the causes specified in the Act maid thairanent, the soume of Ane hundreth merkis: And the Counsell considering his grait panes taken about the said Wark, Thairfoir they grant to him the soume of fyftie merkis farder, and ordanes the same to be allowit in Nicoll Vduart his last yeiris comptis.

*Primo die Augusti, Anno* 1631.

The quhilk day, Alexder Clerk of Stentoun, Provest, &c. . . . . being convenit in Counsell, Ordanes Robert Halieburton, Thesaurer, to content and pay to William Wallace, Maister Maisone and Maister of Wark to the wark and building of the Hospitall of umquhile George Heriot, for his bygane extraordiner panes at the said wark this year bygane, and to encourage him the better in tyme cuming to attend the said wark, the soume of Ane hundreth pundis money, and the same sal be allowit to him in his comptis.

PRECEPT, THESAURER, BLAKHALL.

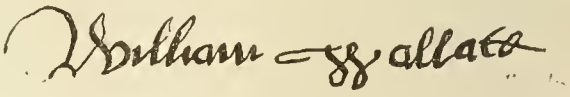
*Vigesimo primo die Mensis Novembris, Anno Domini* 1631.

The quhilk day, Alexander Clerk of Stentoun, Provest, &c. . . . . being convenit in Counsell, Ordanes Robert Halieburton, thesaurer, haveing consideratioun of umquhile William Wallace, last Maister of Wark to the Hospitall, his extraordiner panes and grait cair he haid of that Wark, baith by his advyse, and in the building of the same Wark, in the tyme of his lyiff, and out of thair charitabill dispositioun and regaird the Counsell haid to the said umquhile William, To content and pay to Agnes Blakhall, his relict, the soume of Twa hundreth merkis of gratuitie, togither with the sowme contenit in hir compt, to be imployit be hir to the use and behuiff of hir bairnes, and the said Thesaurer to ressave fra hir the haill muildis and drauchtis the said umquhile Williame haid in his handis.

## No. III.

### RECEIPTS, William Wallace, Master Mason to Heriot's Hospital.

I, Williame Wallace, Maister Maissone to His Majestie, be the tennour heirof, grantis me to have ressavit from Nicoll Vduart, merchand burges of Edinburgh, and Thesaurer to the Hospitall ordanit to be foundit within the said Burgh be umquhile George Heriot, Jewellar to his Majestie, All and haill the sowme of ane hundreth pundis, usuall money of this realme, appoyntit to be payit and given to me, conforme to an Act of Counsell of the dait the third day of August instant, for my bygane panes and extraordinarie service in the Fram and building of the said Hospitall this yeir bygane; off the quhilk sowme of ane hundreth pundis money foirsaid, I hald me weill satisfeit, and thairfoir exoneris and simpliciter discharges the Provest, Bailleis, Ministeris, and Counsell of the said Burgh of Edinburgh, as Feoffis in trust of the said Hospitall, and the said Nicoll Vduart, Thesaurer of the samyn sowme foirsaid, for now and evir, Be thir presentis subscrivit with my hand, at Edinburgh the twelff day of August, the yeir of God J$^{m}$ syx hundreth and twentie nyne yeiris, befoir thir witnessis, Alexander Patersone and James Philp, writtar heirof, servitours to Mr Johne Hay, commone clerk of Edinburgh.



A. Patersone, *witnes.*
Ja. Philp, *witnes.*

I, William Wallace, Mr Massone to Herriot's Hospitall, grants me have ressavit fra Nicoll Wduart, baillie in Edinburgh, the soume of ane hundreth pundis money, and that for the bounteith promissit to me be the Provest, Baillies, Ministrie, and Counsell, fra Julij J$^{m}$ vj$^{c}$ twentie nyne yeiris

till Julij J$^{m}$ vj$^{c}$ and threttie yeiris past, Off the quhilk soome off ane hundreth pundis for the cause foirsaid during the said tyme I hald me weill satisfeitt, and discharges the said Nicoll Wduart and the saidis Provest, Baillies, Ministrie, and Counsell of Edinburgh, for now and ever, Be thir presents subscryvitt with my hand at Edinburgh this 30 October J$^{m}$ vj$^{c}$ and threttie yeiris. WILLIAM WALLACE.

ANDRO DAVIDSONE, *wyttnes*.

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## No. IV.

PETITION of AGNES BLACKHALL, Relict of William Wallace, to the Provost, &c. of Edinburgh.

To yow, my Lord Provest, Bailleis, Ministeris, and Counsell, unto your Lordships humblie meanes and schawes your Lordships Servitrix Agnes Blackhall, relict of umquhile William Wallace, Maister Maisone to your Lordships work of umquhile George Heriottis Hospitall, That quher it is not unknawin to your Lordships quhat extraordiner panes and cair my said umquhile spous haid and tuik vpone the said Wark thir divers yeiris bygane, and at the begynning thairof vpone the modell and fram thairof, And at the pleasour of God is depairtit this mortall lyiff befoir the same Wark is finischt, And hes left me with ane grait burding of many young small babeis, and litill or nothing to susteine thame or bring thame upe upone, And at his depairtour and immediatlie befoir the same, recommendit me, his relict, to your Lordships, trusting your Lordships, out of your godlie cheritie, wald remember his extraordiner panes and cair, to me and his puir bairnes with quham God haid blissit him, And thairfoir to meyne my selff to your Lordships for that effect, Heirfoir I am maist humblie to intreat your Lordships to have consideratioun of the premisses, and of the meyne and puir estait quhairin my umquhile husband hes left me and his small bairnes, And to grant

vnto me, out of your Lordships cheritie and godlie disposition, sum consideratione for my umquhile Husband's extraordinar panes at the said Wark, according to your Lordships awin discretione. And your Lordships answer.

21 *November* 1631.

*Ordaines the Thesaurer to content and pay to this Supplicant, to the use of hir bairnes, ij^c merkis, with the sowme contenit in hir Compt, and to ressave the muildis and drauchtis fra hir.*

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## No. V.

### EXTRACTS from the ACCOUNTS of Nicoll Udwart, Treasurer of Heriot's Hospital, 1628–1631.

The Compter is to be dischairged with the particularis debursit be him vpone the Fabrick of the Building of the Hospitall, and provisioun of materiallis thairto, as followes:—

*Imprimis*, The 22 of Januar 1628, given to W^m. Wallace, Deacone, for ane long lyne for measuring the ground, . . . . . xx s.

Item, mair to him to gar fill up the ditche at the Town-wall, . . . . . xij s.

Item, to the Wricht for making nyne scoir spelkis of tymber, to modell the ground, and for the tymber itself, . . . . . xl s.

Item, the same day, to the Maister Maissone and Maister Wricht and thair servantis to drink quhen the ground was spelked, . . . . . iij lib.

Item, to Andro Davidsone for his attendance both at the measuring and levelling the ground, . . xxx s.

Item, the 26 day, to the Maissones and Wrichtis to drink, at the levelling of the ground, quhen sindrie of the Counsell wes present, . . iij lib.

Item, to Robert Ros the 8 of Marche, being the first oulk of our hewing, for 80 lead of lyme, at ix s. the lead, is . . . . . xxxvj lib.

Item, to William Barroun for 85 fute of stones, at iij s. iiij d. the fute, is . . . . xiiij lib. xiij s. iiij d.

Item, to George Bartilmes for 32 maissours sand, at viij s. the measour, . . . . . xij lib. xvj s.
Item, to fyve Wrichtis this oulk, quheroff Robert Wilsone gat iiij lib., the rest iij lib. xijs the piece, is xviij lib. viij s.
Item, to the Maister Maissone, William Wallace, this oulk, . . . . . vj lib.
Item, to Andro Davidsone this oulk, . . xl s.
Item, gevin to the Maissones this oulk, being thair entrie oulk, to drink, . . . . . xxx s.
Item, the said 24 day of Merche, payit to James Rea, Tounes Thesaurer, for aucht aiker and ane halff of ground coft fra the Guid Toun for ane stance to umquhile Maister Heriot his Hospitall, at nyne hundreth merkis ilk aiker, conforme to the said James his acquittance, Four thousand nyne hundreth thriescoir sex pund thretteine schillingis four pence, . . . . iiij m. ix c. lxvj li. xiij s. iiij d.
Item, the fyift of Apryill to William Wallace, twa dayes, xl s.
Item, for 77 grait stanes for the ground laying, at xxx d. the peice, is . . . . . lx lib. xii s. vj d.
Item, given to the quarriours, to drink on the bargane, xij s.
Item (the 26 of April) to William Watsone, for keiping the work on Sunday, . . . iiij s.
Item, the 31 day of Maij, to sevin maissones, ane haill oulk, . . . . . xxv lib. iiij s.
Item, to the Deacone himselff for fyve dayes, . v lib.
Item, to the warkmen, the 3 of Junij, at the first casting the ground for to begyn the laying, . xxix s.
Item, the 7 of Junij, to the saweris for ane grait trie sawing for lath for rewlis to the maissones, quhilk had 17 draucht, . . xlv s.
Item, to William Wallace this oulk, . . vj li.
Item, to the Deacone for 4 wainscott buirdis to mak muild, . . . . . xxx s.
Item, the 21 of Junij to the Deacone, . . vj lib.
Item, the 28 of Junij, to William Wallace, . vj lib.
Item, the first of Julij 1628, In the name of God, We begane to lay the ground-stane on ane Tyisday eftir the Sermone, and I gaive in drink-silver to the Maister Maissone and his Companiones at the founding of the Work, tua rosnobillis, is, . xxj lib vj s. viij d.
Item, mair given to the barrowmen, in drink-silver, vj lib. xiij s. iiij d.
Item, to Andro Davidsone quha attendis the work, xxxvj s.
Item, the 5 of Julij, to Johne Meik for ten workmen, xviij lib.
Item, to Hew Humble, for 50 fute of stane, . viiij lib. vj s. viij d.
Item, to the Deacone Williame Wallace, . . vj lib.
Item, to Schort and Gilbert, . . . . viij lib.
Item, to uther aucht maisones that haill oulk, . xxviij lib. xvj s.
Item, the 12 of Julij, to the Deacone, . . vj lib.

Item, the 15 day of August, given to William Barroun at the inbringing of ane grait double jam and a peet, with ane uther grait double jam, and a four fute fra Ravestoun; tua lang 13 futtis, and tua ten, fra the Muir, . . . . . viij lib. xv s.
Item, the 16 of August, given to the Deacone and the maissones to drink, at the laying of the Soll of the grait Entrie, and the cruikis imputting to it, xxx s.
Item, to the workmen then, . . . xij s.
Item, payit to Andro Davidsone for sum extraordinarie drink to thame, . . . . . viij s.
Item, (the 13 of September), drink-silver to the maissones at the founding of the first Turnpyik, xxx s.
Item, to the workmen, . . . . . vj s.
Item, to the querriours at the wynning of the grait basses to the Pillaris, . . . . xij s.
Item, (the 20 of September) to Williame Wallace, for 12 maisones at iij lib. xij s. the piece, is . xliij lib. iiij s.
Item, (to Andro Davidsone) for ane half gallon of aill, to the Maisones, . . . . . vj s. viij d.
Item, at the laying of the first Nowall, in drink, . vj s. viij d.
Item, the 15 of October, to the Deacone William Wallace, tua days, . . . . . xl s.
Item, to him, for 12 men, at iij lib. xij s. the piece, xliij lib. iiij s.
Item, (the 12 of December), to William Wallace for 12 maissones a haill oulk, quheroff thrie gettis thrie pund ouklie, and nyne fyiftie-four schellinges, is in all, . . . . . xxxiij lib. vj s.
Item, (the 29 of December) to William Wallace for nyne maissones fyve dayis, quherof Gilbert 50s. and the rest 45s. the peice, is . . . . . xx lib. x s.

*(Wallace himself seems for some time previously to have only given occasional attendance.)*

Item, In the name of God, upone the first of Januarij 1629, gave to the Deacone William Wallace at his entrie to the wark agane, . . . . vj lib. xiij s. iiij d.
Item, mair to the haill Maisones to drink, . . v lib. xvj s.
Item, (the third of Januarij), to William Wallace, thrie dayes, . . . . . iij lib.
Item, to him, for Schort, Gilbert, and Pillens, . ix lib.
Item, to him for uther ten maisones, a haill oulk, xxvij lib.
Item, the seavint of Januarij 1629, to William Wallace, ane haill oulk, . . . . . vj lib.
Item, to Schort, Gilbert, and Pillens, a haill oulk, ix lib.
Item, to nyne of his maissones, a haill oulk, . xxiiij lib. vj s.
Item, to the Deacone for four grait double Scottis dealls for the muildis and platts, . . iij lib.
Item, for three cliftis of sawin daillis for that same purpois, . . . . . xx s.

Item, (the 14 and 21 of Januarij), to the Deacone William Wallace (each time) . . vj lib.
Item, to the querriours of Ravilstone for the twa pilleris and 94 fute of stane, at 7 merk ilk piller, and xvi d. ilk fute of stane, . . . . . xv lib. xij s.
Item, (the 5 of Februarij), to William Wallace, thrie dayis being sick, . . . . . iij lib.

*(During the later months of 1628, and the months of February and March 1629, his weekly payments are usually three, but sometimes four days. His attendance afterwards on the work seems from the sums paid to have been uninterrupted.*

Item, (the 3 of Merche) to the Maisones in drinksilver, at the closing of the legement about the haill work, lviij s.
Item, (the 28 of March) to William Wallace, four dayis, . . . . . iiij lib.
Item, for sex pair of gloves to the Maissones at the founding of the Eist Quarter, . . . xx s.
Item, (the 7 of Apryll), to William Wallace a haill oulk, . . . . . vj lib.
Item, (the 16 of Maij) for ane aikin plank to be sawin for muildis to the Deacone, . . xxiiij s.
Item, (the 23 of Maij) to the Maisones at the upputting of the first irone wyndowis, . . . vj s.
Item, (the 30 of Maij) to the Maissones at the putting up of the first chymlay brasses, to drink, . vj s.
Item, to the Measones, at the casting over the Ogé of the Kitching chymlay, in drink, . . xxiiij s.
Item, (the 13 of Junij) to the Measones, for the lintells, brasses, and kee pend of the Kitching, to drink, . . . . . xij s.
Item, the first of August, to the Maisones for thair lintell and key drink-silver, in the Wester Quarter, xxx s.
Item, to James Rewll for xvi trees for the cowmes of the Eister voltis, at xiiij s. the peice, is . . xj lib. iiij s.
Item, (the 5 of September) to Andro Davidsone for sax poyntis aill to the Maissones, . . . x s.
Item, to Thomas Broun quhen he maid out the first elleven irone Wyndowes, given him 5 stane irone and iiij pund, at xxx s. the stane, in all, . vij lib xvij s. vj d.
Item, (the 19 of September) for ten cliftis of seasoned wanscot for the mouldrie, to the Deacone, . iiij lib.
Item, (the 3 of October) to Andro Davidsone, that he gaif in drink to the Maisones and workmen at the setting of the first Pillar peeces, . . xx s. viij d.
Item, (the 10 of October) to William Wallace, ane haill oulk, . . . . . vj lib.
Item, to Thomas Broun, smyth, to close his first compt when he maid the elleven grait Windowes, . xxxij lib. xij s.
Item, mair given him quhen he outred the last aught grait Windowes of his secound compt, . ane cxxxiij lib. viij s.

Item, the third of August 1629, given to William Wallaee, Maister Maisone, be direetioun of the Counsell, for his bygane bounteth, in attendance upon the Work, aecording to his acquittance heirwith exhibit, is . . . . . ane c lib.

Item, in ehairges with him in Leith, at the wayling of sum timber thair for the eowmes and centreis, . xvj s.

Item, to William Aytoun, maisone, for his bounteth, vj lib. xiij s. iiij d.

Item, the Compter is to be disehargit with the haill grait Jeists that eome from Norroway, quhilk was lyeing in Leyth, and is now brocht vpe to the Wark, as may eleirlie appeir by the former Compt at sindrie tymes, with the quhilk the Compter chargit him selff in his former Compt.

Item, The first of Januar 1630, to William Wallace for his bounteth gloves, . . . . . vj lib. xiij s. iiij d.

Item, to William Aytoun, becaus the lest yeir he gat bot 3 lib. 12s. given him in bounteth, . . vj lib. xiij s. iiij d.

Item, to the haill Maisones, . . . . . v lib. xvj s.

Item, to the barrowmen, . . . . xxix s.

Item, to William Wallace, a haill oulk, . . vj lib.

Item, to Sehort, Aytoun, and Pullones, a haill oulk, ix lib.

Item, to thretteine Maisones, a haill oulk, . . xxxv lib. ij s.

Item, (the 9 of Februar) to William Wallace, for seavin seoir of vrnell hewing be his Boy, at 40 d. the peice, is 23 lib. vj s. viij d., quheroff rebait to him for 25 fute of stone he borrowit 4 lib. 3s. 4d. given him, . . . . . xix lib. iij s. iiijd.

Item, (the 13 of Merche) given to the Maissones at thair entrie to lay, and thair quarter drinksilver, . v lib. xvj s.

Item, to William Wallaee and his boy, . . vij lib. x s.

Item, the 11 of Junij, for the key aill, quhen the grait Oger pend of the Foir Entrie wes put over, . lviij s.

Item, (the first of Julij) given to the Maisones and workmen for the Invaird pend of the Foir-Entrie, the key aill, . . . . . v lib. xvj s.

Item, (the 25 of September) to Robert Tailfair, paynter, for laying over twyse the irone windowes with red lead, till a compt, . . . . . v lib. xvj s.

Item, to the Maissones for the key silver at the easting over the double eowme at the Eist North Eist quarter, . . . . . xx s.

Item, to William Wallace, twa dayes, and his boy a haill oulk, . . . . . iij lib. x s.

Item, (the 30 of October) to the Maissones and barrowmen thair quarter drink silver, . . . . v lib. xvj s.

Item, to Aytoun, Schort, and Pillones, a haill oulk, xij lib.

Item, to William Wallace fyve dayes himself, and his boy a haill oulk, . . . . . vj lib. x s.

Item, to the twa Aytounes for thair twa oulkis wages at the going away, . . . . vij lib. xij s
Item, to the Carver for his bounteth, . . vj lib. xiij s. iiij d.
Item, (the 2 of October) to William Wallace, Maister Maisone, be Act of Counsell, for his bounteth fra Julij 1629 to Julij 1630 (£100), . ane c lib.
Item, to William Aytoun his extraordinar, . vj lib. xiij s. iiij d.
Item, (the 22 of January 1631) to thair (the workmen) entrie to the new Ludge, ane barrel aill, . iij lib. iiij s.
Item, (the 9 of Apryill 1631) to the Paynter for culloring 13 windowes, . . . . xj lib. xiij s.
Item, (the 23 of Apryill) to Alexr Isaak, wrycht, for making the muildis, and to John Thomme, maissone, xxxvj s. viij d.
Item, (the last of Apryill) to William Wallace and his boy, . . . . . viij lib.
Item, to 14 maisones, ane haill oulk, . . l lib. viij s.
Item, to William Barroune for 12 thrie futes ane grait rebit for the Chapell dure, with 2 feets and ane 8 fute stane, . . . . . ix lib. xiiij s.
Item, to John Blak for 28 peetis, . . . iiij lib. iiij s.
Item, to William Wallace and his boy. . . viij lib.
Item, to 21 maisones ane haill oulk, . . lxxv lib. xij s.
Item, upon the 6 of Maij, at the keying of the Volt, to the Maisones amang them, . . . . lij s.
Item, (the 7 of Maij) mair to the warkmen the first day putting over the pend of the Volt, sex pyntis of aill, . . . , . . . . x s.
Item, (the 28 of Maij) to William Wallace and his boy, viij lib.
Item, to 23 maisones ane haill oulk, . . lxxxij lib. xvj s.
Item, (the 4 of Junij) to Robert Schort and John Campbell for vij xx (seven score) and viij peetis, at 3s. the peice, is . . . . xxij lib. iiij s.
Item, to John Blak for 16 peetis, . . . xlviij s.
Item, to William Barrone for 53 futes 2 grait stanes for the Chapell dure, ane doubill rebit, and ane 5 fute, . . . . vij lib. xviij s. viij d.
Item, to the warkmen that led the peettis, . iiij s.
Item, to the maisones that hewit the Soll of the Chapell dure, . . . . . iij s. iiij d.
Item, (the 13 of August) to Alexander Cleghorne for 12 3 fits 2 grait stanes for the Chapell dure, ane stane for the turnpyck, and twa stanes for the Chapell wyndow, is . . . . ix lib. vij s. viij d.
Item, to John Ronnald, quarriour, for the 5 stanes, iij lib. xv s.
Item, to William Wallace, 4 dayes, and his boy, ane oulk, . . . . . vj lib.
Item, to 16 maisones ane haill oulk, . . lvij lib. xij s.
Item, (the 10 of September) to the warkmen for dichting the Well, 7 pyntes of aill and thrie bread, xiiij s. viij d.

Item, (the 17 of September) to the warkmen at the diehting and making of the Well, . . xiij s. iiij d.
Item, (the 22 of October 1631) to Alexander Hunter, for 18 laid lyme, . . . vj lib.
Item, to George Bartilmo for 18 laid of sand, . xlv s.
Item, to William Wallace and his boy ane haill oulk, viij lib.
Item, to 14 maisones ane haill oulk, . . l lib. viij s.
Item, for 6 pair of gluiffis to the measones, . xxxij s.
Item, (the 29 of October) to Robert Ros, for 20 laid lyme, at vj s. viij d. the laid; and to Robert Hunter for 10 laid lyme, at vj s. viij d the laid, xj lib. vj s. viij d.
Item, to George Bartilmeo for 17 laid sand, . xlij s. vj d.
Item, to William Wallace and his boy, 5 dayes and ane half, . . . . vij lib. xvj s. viij d.
Item, to 14 maisones ane haill oulk, . . l lib. viij s.

The Comptar is to be dischargit with the particularis debursit be him upone the bigging of the barne besyid Lochflat land as followis:—

Item, given out and payit to umquhile William Wallace wyeff, conforme to the Compt gevin in be hir, and the aggriement maid with the said umquhil Williame, be directione of the Counsell, for 10 ruid and 6 ells of wark, at 10 lib. the ruid, is 102 lib., Sex duris, at 6 lib. 13s. 4d. the dure, vj xx (six seore) peits, at 6d. the peice, 2 windowes, at 4 pund the peice, and 7 slittis, at 7 lib., is . (£193) ane e lxxxxiij lib.
Item, for metting the barne, . . . xxxiij s. iiij d.
Item, payit, at command of the Counsell, to William Wallace wyiff and hir bairnes (£133 6s. 8d.) . . . . . ane e xxxiij lib. vjs. viijd.
Item, mair payit to hir for hir ludge, to be James Broune's ludge, . . . . xx lib.

## No. III.

# REPORT BY ARCHITECTS OF GLASGOW,

FELLOWS OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND,

ON THE

# SANITARY IMPROVEMENT OF THE CITY OF GLASGOW.

[*Read at the Meeting of the Institute in Glasgow, the 11th December* 1851.]

IN terms of the communication conveyed to us through Arthur Forbes, Esquire, one of the town-clerks of this city, of date the 5th November last, in reference to the erection of certain buildings intended for the occupation of tenants of the humbler classes, and which were likely to become, ere long, most injurious to the public health, the *foci* of disease and poverty, and, on the occurrence of an epidemic, the certain means of propagating fever in the neighbourhood, and to the best course to be adopted with the view of preventing the erection of such buildings throughout the city, and of promoting its sanitary improvement,—we have made personal inspection of many portions of the city, have considered its various features, in reference to the principal points

of enquiry, and, after numerous meetings and much deliberation, now take the liberty of submitting the following Report.

It seems at the outset to be hardly necessary to produce any evidence in regard to the evils for which a remedy is so urgently demanded.

The over-crowding of the inhabitants of this city within excessively limited bounds, the over-peopling of numerous localities, the defective sewerage, and the still more defective supply of water, are too well known. We need no evidence as to the existence of these things—they are before us, and may be seen by every one. Let any one examine, even by a casual visit, any of our densely peopled wynds or closes, and he will at once feel mournfully convinced of the sad reality.

Who can think of these miserable places, the abodes and nurseries of filth and disease, and of crime, the plague-spots to which strangers point to our shame, those great impediments to the successful labours of the philanthropist and the Christian, without the deepest and the most compassionate emotions.

But these alone will never suffice to meet this tremendous evil. We have now work before us, to cure and to prevent; for it must not be forgotten that the evils so justly complained of are not confined to the older portions of the city. The over-crowding of houses, and comprising vast numbers of human beings together, almost without light or air, are going on all around us; and the remedies required are therefore for prevention as well as for cure.

Under the strongest conviction that if these evils be fearlessly met,—if wise and wholesome provisions be made—if ample powers be given to enforce them,—the sanitary condition of the city will be vastly improved, and the moral standing of the masses elevated,—we proceed to treat of these re-

medial measures; and that we may present them in a regular form, we have divided the subject into the three following sections:—

*First*—THE WIDTH OF STREETS, HEIGHT OF BUILDINGS, AND OPENING UP OF THOROUGHFARES.
*Second*—DRAINAGE.
*Third*—SUPPLY OF WATER.

Following this arrangement, we take up the first section, viz.:—

*Section First—The Width of Streets, Height of Buildings, and Opening up of Thoroughfares.*

It is obvious that thorough ventilation—complete diffusion of light and air—are primary objects in the construction of a city. Rapidly growing cities, like ours, are too frequently neglectful of these important elements; and consequently, from a want of expansiveness sufficient for the growth of the population, have been subjected to all the evils arising from the congregating of vast masses in overcrowded localities. Even at the present day the evil has been perpetuated, and from the high price of ground and other causes, temptations are continually in the way, leading to the erection of crowded courts and lanes, which will, in the course of a few years, become as intolerable nuisances as the older portions of the city.

Allusion cannot fail to be made here to the buildings recently erected in the Drygate, now known under the appellation of the 'Rookery.' In this erection, where fifty-three families are to be accommodated—all having access by one common stair, the steps of which between the wall and the newal are only about two feet nine inches wide—where the apartments are so miserably confined, some of them for one family being only

about 10′ : 6″ × 9′ : 6″ and 7′ : 8″ high—where the access from the street is so tortuous and narrow, and where no attention whatever has been paid to proper ventilation,—everything that can minister to the comfort and well-being of the classes who may inhabit it has been grossly overlooked.

The subjects now to be considered are therefore surrounded with many difficulties. Doubtless the remedial measures to be proposed will encounter much opposition, but all private interests ought to give way to the public good, and legislative enactments ought to be obtained for the purpose of carrying the necessary remedial measures into effect.

In laying out new streets and lanes, it is our opinion that the width of these should, in a great measure, be regulated by the locality and the class of houses intended to be erected.

For self-contained houses no street should be narrower than 80 feet. In this width of street we would restrict the height of the front wall to 35 feet above the line of pavement, embracing two square storeys above the basement. For each additional storey 10 feet ought to be added to the width of the street, but the corner and centre houses of a compartment might be built a storey higher. For this class of property the ground from the street building line to the centre of the lane behind should not be less than 110 feet in breadth, and the lane should not be less than 16 feet in width.

The back jambs of houses, or the returns of houses, in cross streets, should not come nearer than 45 feet to the centre of the lane. All public buildings requiring the occupation of more back ground should be restricted to have areas or open spaces on each side, each not less than 15 feet. In no case should dwelling-houses be allowed in the offices next the lanes.

For houses built in flats the width of street should be determined by the height of buildings. For instance, three

square storeys above the line of pavement should have a street not less than 60 feet in width, and for each additional storey upwards 10 feet should be added to the width of the street. Houses of this class should be of a uniform height in each street. The space behind should, from the line of the back wall to the lane, be equal in breadth to the height of the front wall of the tenement, and the lane be 16 feet in width. In no circumstances should back lands be allowed. Back jambs of the tenements or returns in cross streets should not approach nearer to the centre of the lane than 44 feet. No separate dwellings in attics or in sunk floors should be permitted.

In the wider streets we would urge that they be freed from all unreasonable restrictions with respect to such projections as may be proposed ; such, for instance, as balconies and corbelled-out bay, or other projecting windows, as we are satisfied that in many cases such projections would considerably beautify and give a picturesque character to our street architecture.

By no means the least important class of property are the dwellings of the working classes. These houses should possess all the comforts and conveniences necessary for the physical and moral health of their inhabitants. An amount of at least 1512 cubic feet, and a height of ceiling in no case less than 9 feet, should be secured to each apartment. To 1512 cubic feet of apartment there should be at least 21 square feet of light.

The space between the back walls of compartments should not be less than 60 feet, with a central lane not less than 10 feet wide. No houses of this class should be built with dwelling accommodation in the sunk floors. The unhealthy concealed beds should in every case be condemned ; and all bed closets as substitutes should contain only a single bed,

have not less than 48 square feet of floor, and be both well lighted and ventilated. All fixed beds should be made of iron.

Water-closets should be attached to every dwelling, and water and gas introduced by the proprietor. The water-closets should be plentifully supplied with water, and sufficiently ventilated, and the apparatus should be simple, substantial, and little liable to accident or injury. One dust-shaft should be provided for each tenement, communicating from the stair-landings to a receptacle underneath.

The number of dwellings on each stair-landing of houses for the working classes should be strictly limited to three, making two houses of not less than a room and kitchen each, and one house of a single apartment; and for safety and ventilation the stairs should be scale stairs, lighted from the outside, and the steps should be not less than 3 feet 9 inches in length.

No privies should be permitted in courts, neither should there be ash-pits nor dung-steads. The police have it in their power to remove daily the accumulation of ashes, &c., as is the practice in many towns.

It ought to be imperative that no new houses should be allowed to be inhabited until they have been certified by competent authorities as being fit for occupation, or for the purposes for which they have been built.

All chimney-cans should be strongly secured, to the satisfaction of the authorities. Landlords should be bound to have all public stairs properly lighted with gas.

We strongly recommend that power be given to the authorities to provide suitable district baths and wash-houses for the working classes.

In the future laying out of grounds into building plots, we recommend that, from public considerations regarding both

the physical and moral well-being of the community, squares, circuses, and other large vacancies should be secured to the city, and that proper encouragement should be given to the securing of lands for the formation of public parks in different districts of the city, for the healthy recreation of its inhabitants, its adornment, and improved ventilation.

In respect to graveyards within the city, power should be sought to prevent any future interments within them, and by remaining open spaces, sacred to the dead, they would ultimately become serviceable in a sanitary point of view. Vault interments under buildings should be strictly prohibited.

There are many other subjects to which we might have directed attention in this section of the report; for example, fish shops, butchers' and green grocers' shops should be removed from the public streets, and district markets provided.

More stringent measures should be adopted for the ventilation of public works, which emit nauseous odours. We need not here advert to the importance of enforcing the consumption of smoke in all public works, as that subject is now receiving the careful attention of the authorities.

Greater attention should be given to the efficient lighting of all streets, lanes, courts, and closes. The lighting of courts and closes, as well as streets, should be under the management of the police.

All public places of amusement, or buildings where there may be large assemblages of people, should have fire-proof stairs, without wheeling steps, and of easy egress, and the doors should be made to open outwardly.

The opening up of new thoroughfares, and the carrying out of these suggestions in those portions of the city already built, will inevitably be a gradual work. At the same time, it is obviously very desirable that every facility should be afforded in carrying out those prominent points which the general good demands.

In obtaining an act to enforce these improvements, provision should be made for opening up streets, lanes, wynds, &c., in the denser parts of the city, and for acquiring ground on which houses for the working classes may be erected, with power to refeu at a moderate rate.

The principle we have previously laid down for new houses as to the number of dwellings to a given space of ground, should be made to apply in the reconstruction of all waste property in the city.

The board, or authorities appointed, should be empowered to levy for these purposes an assessment upon the citizens, not heavier than that presently exacted for the court houses and county buildings, which we believe to be not more than one penny per pound on rental. For such a praiseworthy object no one could reasonably object to pay so trifling a sum.

The proprietors of ground, in laying out plans for feuing, should be bound to make streets, &c., in reference to contiguous properties, whether already built or yet unbuilt, and should have these plans sanctioned, in reference to these and other points, by the competent authorities.*

All parties submitting plans to the board should be required to delineate on them the mode by which they propose

* 'But there is an important element of the subject generally that has not 'yet been considered, important alike to the comfort and convenience of the 'public ways, and, incidentally, to the public health as affecting general venti-'lation. This is the arrangement and disposition of the streets in adding to 'a town. Owners of extensive estates, such as the Duke of Bedford, the 'Marquis of Westminster, Colonel Walpole, and many others, in London, 'have within their own hands, when laying out their lands for building, the 'means of protecting their own proper interests, and of subserving the con-'venience of the public; but in such cases, even, it would be beneficial to all 'parties if there were a public authority competent to impose upon the several 'owners of adjoining lands, and of lands adjoining parts of a town already 'built upon, such arrangements as would make the future streets most con-'venient to all, without inflicting injury upon any. If this be desirable as it 'regards large estates, it is much more so when small ones are affected, and to 'these the observation applies with full force.

to ventilate the houses. Every apartment of a house ought to be ventilated, independently of doors and windows.

### *Section Second—Drainage.*

In approaching this subject we feel deeply impressed with its peculiar importance. The department of drainage occupies a position so prominent that, if defective, it will go far to neutralize or destroy any improvements that may be otherwise introduced.

Streets the most spacious, and squares the most magnificent, may adorn our city,—the purest water may pour out its abundant blessings, and yet a hot-bed of pollution may accumulate around and beneath us, the festering corruption of which will tend to frustrate what might otherwise be the purest development of sanitary art.

Having made a minute and personal inspection of various districts of the city, we have had no difficulty in obtaining a mass of conclusive evidence of the fact that the state of our

'A landowner laying out his land anew for building has the benefit of all 'existing public streets and roads up to his land, and for these he has paid 'nothing, and he ought to be compelled, in return, to open his roads, as a 'means of public access, to whatever may lie beyond, whether it be town or 'open country, upon such reasonable conditions as the circumstances may re-'quire in each particular case.

'These considerations become of even greater importance when the sub-'ject of drainage is considered, in connexion with the ventilation and the 'convenient use of streets. Sewers to be convenient must be led along the 'courses of streets, and consequently streets should be laid out, connected 'and extended with reference to the proper courses for the sewers, as well 'as for the streets as ways of communication to and about the houses.

'Streets, sewers, and drains, together with the contingent services of water 'and gas, and all other matters affecting the public health, comfort, and safety, 'or any of them, ought to be combined in one system, and be in every town 'under the conservancy of the same, and that a sufficient authority to regu-'late them for the public good.'—*Hosking's Guide to the Regulation of Buildings and Towns, p.* 54.

drainage is alarmingly defective, principally as regards the confined wynds, lanes, and closes.*

Like many other large cities, Glasgow has to contend not only with the existence of a scanty and defective drainage,† but also with another master evil, viz., the gigantic error of discharging into the bed of the river the accumulated filth and sewage matter of this vast community.

How far the practice of using a river for the drainage of any town upon its banks may be allowable in certain favourable circumstances we need not at present determine ; but in the case of Glasgow, with a population approaching to 400,000, and a river, even in its improved condition, comparatively limited in width, depth, and velocity, the supposition that we may, within a very confined range, discharge with impunity such a concentration of poison, is an error the most untenable and dangerous. If the Clyde must be used as the great common sewer of this city, it must only be under such arrangements as shall secure its salubrity, instead of, as at present, loading our atmosphere with its deadly malaria.

In order to remedy these evils, we beg to submit the following plan for the drainage of Glasgow, as being at once practicable and effective.

*First.* That instead of running all the main sewers into the river in its course through the city, the whole sewage matter should be conveyed through properly constructed conduits to a distance, as far as practicable, below the city. It is further proposed that the run of these conduits should commence, say at the Molendinar Burn, where it enters the Clyde, thence to be conveyed westward behind the quay walls of the harbour, and beyond these along the bank of the river.

* It is gratifying, however, to know that the attention of the authorities has been given to the drainage of the city, and that, under the able superintendence of Mr Carrick, considerable improvements have already been effected.

† There is, we understand, about 90 miles of streets in Glasgow at the present time, and only 45 miles of common sewers.

These lines of main parallel conduits could thus have the benefit of a continuous scour of water from the Clyde, from a weir constructed for the purpose. The sewage matter thus copiously diluted might be at once discharged at the western extremity, and mingle with the waters of the tide. Whether or not advantage may be taken of preserving the sewage matter in tanks, or settling ponds at the termini of the conduits, and of using it for agricultural purposes, is a point in dispute, and we do not here give any opinion regarding it.

*Second.* Presuming that the principle of constructing these main lines of conduits is adopted, it is next proposed that all the main feeding sewers on either side of the river be led into them, that an abundant supply of pure water be secured in large tanks or reservoirs, at the highest levels of all these feeding sewers, which supply should be constantly kept up, and any sluggish soil or deposit cleared away by the propulsion of this water from these fountains, at regular and frequent intervals, and this more particularly during the hot months of summer. Of course, if the water be introduced to the city by gravitation, these tanks will not be necessary.

*Third.* With regard to the smaller or branch drains throughout the city, and particularly those connected with the dwellings of the humbler classes, a fountain-head of water should be established and maintained in each close or wynd, for the purpose of clearing them of all impurities. A similar apparatus could be supplied to the superior class of houses under the pavement in front, or in the lanes behind, to regulate which it is suggested that the police force of the city would be fully adequate, and thus a regular supply of water could be diverted into these channels at pleasure. In reporting upon their respective districts, it would then become part of the duty of these police officers to see that all this apparatus is maintained in good working order.

Common sewers ought to be carried along the centre of

lanes, where practicable, for, by the present system, wherein drains are in the centre of streets, the whole soil from water-closets, and the waste water and suds from sculleries and washing-houses have in most cases to be taken through the whole width of the house, rendering it often very unhealthy, and as the drains frequently require renewal and repair, giving rise to great annoyance and discomfort to the family. Besides this unhealthiness and annoyance, the additional expense of taking drains entirely throughout the width of a building will be avoided, and a large supply of house water more immediately obtained for detaching and carrying away the soil. Drains from surface channels, however, would require to be carried along the street, and should be returned at the corners of the different compartments, and let into the common sewers in lanes. By this method any unpleasant effluvia arising in the streets would be altogether avoided.

*Fourth.* In dense localities every privy and ash-pit should be removed, all ashes, &c., regularly taken away from the dwellings every day by the police, and instead of the old filthy privies at present in use, the new public necessaries lately erected by the police ought to be greatly multiplied. The soil from these might still continue to be carted away as at present, or they might be connected with the public sewers of the city, each having a large and efficient flushing apparatus attached to it.

These old public necessaries and ash-pits, which are so abominably conspicuous in the closes and wynds of the city, may be considered as a series of large stagnant and open cess-pools. The fœtid atmosphere arising from them is quite sufficient to generate pestilence of every kind.

The evidence of Henry Auston, Esquire, architect, upon these (stagnant) cess-pools or public privies is very strong. He says—' It was the state of the soil where the Blackwall ' Railway was constructed which first drew my attention to

'the necessity of abolishing (all such) cess-pools in towns. 'I have found that fœtial matter, or the soakage from the 'cess-pools, had in some cases actually joined from house 'to house. The soil in immediate connexion with the 'houses, and surrounding the foundations, was so saturated 'from the cess-pools as to be, in my opinion, in a worse con-'dition than in dung heaps. It was exceedingly offensive to 'remove, and it was constantly matter of remark how human 'beings could be found to do it. When exposed, it drew 'forth the complaints of the neighbours at some distance. 'I have no hesitation in expressing my opinion, that in all 'town districts, and in all districts wherever any drainage 'can be got, the use of (such) cess-pools ought entirely to be 'prohibited.'

Under this head it may be stated that proprietors ought to be compelled to supply the means of getting quit of all the soil, ashes, and refuse connected with every house, whether in property already occupied, or in that about to be built.

*Fifth.* Intimately connected with the working of water-closets, is a cistern for the supply of water. The cisterns at present in use are liable to many objections ; the apparatus of ball and ball-cock is cumbrous and liable to go out of repair ; the water frequently stagnates and becomes foul, especially in houses that have been for any length of time unoccupied ; noxious impurities are generated, and if any vegetable matter is mingled with the water, the lead is oxidized, and the water becomes poisonous.

To obviate these objections, it is proposed that a circulating cistern should be substituted. This cistern should consist of a cylindrical tube or box of cast-iron from twelve to eighteen inches diameter, and from five to six feet in length, having the requisite connexions for the supply and discharge of water attached to it. As this cistern would in

other words be simply a continuation-pipe from the main, but of much greater diameter, the water contained in it would be constantly circulating, and always fresh and good, and, according to the dimensions given it, would contain from fifty to sixty gallons to serve against contingencies.

*Sixth.* In order to the effectual carrying out of these measures, it is evident that the city must be supplied with the gravitating powers of a large body of water, the minutiæ of which will be discussed under another (the third) section of this enquiry.

Having thus enumerated the leading principles which ought to govern an efficient system of drainage for the city of Glasgow, we beg to submit a few additional statements tending to illustrate the subject by a few practical details.

1*st.* Respecting the construction of the sewerage. In order that the offensive matter contained in every sewer be passed off as quickly as possible, it is evident that every impediment to the free passage of the soil should be removed, and every contrivance tending to accelerate its movement be adopted. Thus, we find from experiment, that if the friction of a certain body of water be represented by 124 in a flat-bottomed sewer, by forming the bottom of the sewer into the segment of an arch, such as is used in the Westminster district, the friction of the same body of water will be reduced to 115 (See figure No. 1); and if the form of the curve be still further modified to the egg shape, such as is used in the Finsbury district, the friction will be still further reduced to 100 (See figure 2). We therefore conclude that, in so far as formation is concerned, those constructed of the egg shape are the best. Again, we find that the friction of water on a glazed stoneware surface is still less than on a brick and lime surface of the same form. We conclude that

the construction of sewers and drains of that form and material, such as are exhibited in Figures 2 and 3, are superior to them all. We would therefore propose that all the main drains and sewers should be so constructed, or, at all events, that the under half of them should be lined with this material. Besides, we are assured that this stoneware material is so strong that it is capable of resisting any amount of superincumbent pressure, that it has sustained an internal pressure of 300 feet before breaking, and that the material itself, for all draining purposes, is imperishable.

The pipes, to which we have more particularly referred, are such as are manufactured at the Lambeth potteries, London, or at the St Helen's potteries, Lancashire.

The egg-formed brick sewer of Finsbury is much better adapted to resist lateral pressure than the upright sewer of Westminster, and the economy of material in the construction of the one, as compared with the other of the same capacity, is as 175 bricks per foot for the former, to 261 of the latter. One mile in length, therefore, of the upright form would require 1,376,080, while one of the egg form would require only 924,140 bricks, thus establishing a clear saving of more than half a million of bricks per mile.

In addition to this, we have to state that the sizes of sewers and private drains hitherto in use are much too great, and that if the vitrified stoneware pipes above referred to were generally adopted, as they ought to be, a pipe six inches in diameter is quite large enough for a large tenement of houses, and one of two feet bore quite sufficient for the main sewer in any important street.

2*d*. A copious flow of water from the highest levels of the feeding sewers has already been provided for ; but there are many of these sewers, particularly on the south side of the river, the declivity of which is so very small that

it is considered highly expedient that their flow should be accelerated by a complete flushing apparatus, having the floodgates placed across the sewer, say every fifty yards apart. By these means a large head of water is collected and suddenly discharged through the sewer as required. In the meantime, however, and until another and better supply of water can be introduced into the city, arrangements ought to be made with the present Water Company to flush all the sewers, at frequent intervals, which are within workable distance of the company's reservoirs at Rotten Row and Garnet Hill.

*3d.* In order to facilitate the flow of all sewage matter at the various junctions, it ought to be made imperative that all those junctions should be formed to a regular curve of a quarter circle, having as long a radius as possible, and that they should never be connected at right angles. These statements are supported by the following facts, as elicited by repeated experiments :—

For a curved junction of 20 feet radius, resistance 100
For a curved junction of 5 feet radius, resistance 146
For a curved junction at right angles, resistance 316

*4th.* All the gully-holes in streets, as also every connection with main and branch sewers and drains, should be trapped upon the most approved principle, so as to prevent any effluvia from contaminating the surrounding atmosphere, or finding its way back through the private drains into the various dwellings of the city.

*5th.* Were the supply of water copious, the declivities of the sewers considerable, and the drains all properly constructed as above described, the necessity of all flushing would be obviated, and comparatively little foul air would be generated. But in Glasgow, as in many other manufac-

turing cities, many of the main sewers are deficient in fall, condensed steam and warm water from public works are perpetually running into them, which aid decomposition, and thus generate effluvium, so that deleterious and offensive gases are always present in the sewers, and hence the need of devising some effectual means for ventilating them. The erection of large chimneys at the highest levels of the sewers has been recommended; but we are rather disposed to adopt a series of ventilating shafts for this purpose, which could be carried up through the gables of the various tenements, and would thus be the means of carrying off any foul odours that may be lodging in the private drains, as also any exudations arising from the main sewers being imperfectly trapped. 'And it 'must be borne in mind that a communication by a drain 'from the sewer, if not properly ventilated and trapped, may 'bring into the house the emanations from a whole district, 'and that wind blowing into the mouths of sewers carries a 'backward current of emanations into the houses and streets 'of the upper parts of the district.'

*6th.* In order to the effectual carrying out the various recommendations above enumerated, it is absolutely necessary that the whole of the existing drainage throughout the city should be examined and made good, and that a complete survey of the whole city be immediately proceeded with. This might be done in sections, and delineated to a large and uniform scale. All the existing leading sewers, together with the branch and private drains, where practicable, should be accurately laid down, at the same time the dimensions of the sewers should be shewn,—their depths, declivities, position of the flushing-gates, gully-holes, &c. These plans might be engraved or lithographed, and distributed amongst professional men, as well as the various public bodies interested in city property, to guide them in their building operations.

It is further suggested that the delineation of a series of contour lines, either upon the same plans, or transcripts of them, would be of immense benefit, so as to shew at a glance the different and corresponding levels throughout all the parts of the city. The application of a general system of drainage would in this way be much simplified, and the process of harmonizing the levels of the different lines of sewers in the various sections of the city would be rendered much more simple, accurate, and satisfactory.

*7th.* That as it will be necessary to break up both the streets and the pavement for the introduction of the new, as well as for repairing the defects in the old drains and sewers, it would be of immense importance to have the pavements, as well as the carriage-ways, committed to the care of one undivided trust, and maintained at the public expense. It would be of incredible benefit to the public, inasmuch as the various pathways or pavements throughout the city would be maintained in a much better condition, and the perpetual jarrings betwixt the proprietors and the police be for ever terminated.

*8th.* In proceeding with these remedial measures, we consider it imperative that the Molendinar and Barrowfield Burns be converted into common sewers, and arched over; that the Pinkstone Burn, and all drains or sewers from distilleries, chemical or other public works, be conducted by separate drains into the main conduits, and connected with them at a considerable distance below the city; that no drains from any other property be led into them; and that, as the value of adjoining property is seriously affected by the noxious vapours arising from the chemical works, some stringent measures should be adopted to keep them under reasonable control, as well as to keep down or prevent the effluvia.

*9th.* That a separate plan for the drainage of each building or tenement proposed to be erected within the boundaries, specifying the various descriptions, sizes, and declinations of the various drains, be submitted along with the other necessary plans, either to the Dean of Guild Court, or to a board appointed for sanitary purposes, and sanctioned by them as sufficient, and that no connexion betwixt these private drains and the main sewers be allowed without a regular certificate of their sufficiency.

That the board should have full power to assess the various parties proposing to make use of the main sewers in proportion to the amount of their frontage. That in the event of any proprietor allowing any of his private branch drains to go into disrepair, or to become foul from neglect, so as to become prejudicial to the health of the inhabitants, the board shall have the power to cut off the connexion with the main drain, and to declare the property uninhabitable. That the different officers connected with the board be paid from a regular assessment levied upon the whole community, and that this board should hold such stated meetings—say weekly, or oftener—as may be considered necessary, for the purpose of hearing and adjudicating upon such cases as may come before it; and that the members and officers connected with it be enjoined to make stated and frequent inspections of the whole district committed to them, and to prepare detailed annual reports of the condition of the whole city, which should be regularly published for the benefit of all concerned.

### *Section Third.—Supply of Water.*

A sufficient supply of good water is of great importance in every situation, but more especially in cities and towns. Prior to the commencement of this century the city of Glas-

gow was dependent on spring wells, or butts supplied with water from the Clyde, and sold on the streets at a halfpenny per gang.

In the year 1806 the Glasgow Water Company was formed, and the Cranston Hill Company in 1808. The population at that time amounted to about 100,000, and the city was very well supplied for many years by these two companies.

The rapid increase of the city in population as well as in public works, soon required a greater supply than could be furnished; and a few years since the inhabitants of the Gorbals, on the south side of the river, formed a joint-stock company for supplying that district by gravitation, which is at present in full operation, and giving great satisfaction. At the present time the Glasgow Water Company undertakes to supply the north side of the river only. In this district the population amounts, in round numbers, to about 300,000, (or three times the amount at the time the two companies were formed,)—without considering the increase of public works, on this account, the high parts of the city, such as Garngad Hill, Garnet Hill, and Port-Dundas, are so indifferently supplied as to require the use of force-pumps and cisterns.

We are of opinion that the best method of supplying cities and towns is by gravitation.

We do not here give any opinion as to whence the water should be brought, or the cost of such extensive works as will be necessary. We only recommend that the water be carefully selected, pure, soft, and wholesome, and that the supply be abundant.

The gravitation system possesses great advantages. The annual expense connected with it is comparatively small. The Gorbals works, for instance, are stated to require only one superintendent, with the occasional assistance of two or three labourers.

On the other hand, the steam power of the Glasgow Water Works is above 650 horse power, which, taken at ten pounds per horse power, amounts to 6500 pounds per annum, to which must be added the amount of capital, the risk of breakage, and the tear and wear of expensive engines.

The supply of water ought to be constant, and we would suggest that it be imperative on proprietors and landlords to take the water into every house, however small. In a sanitary point of view this would be very beneficial, for if the water has to be carried up two or three pairs of stairs, it will be done as seldom as possible, and, as a natural consequence, the dwellings and their inhabitants will be kept in a filthy condition.

The stand-up pipes in closes, courts, and on the streets, should be all done away with, the waste of water being enormous. The courts and closes are by these pipes kept always wet, while the water soaks into the foundations of the buildings, and makes them damp and unhealthy. Proper pipe-drains should be laid under ground to carry all the waste and rain water into the sewer in the street. No surface-drains should be allowed.

Were the water brought into Glasgow in sufficient quantities, say fifty gallons per day for each individual, which is the amount we would recommend as being sufficient for the inhabitants, and for the supply of cattle, steam-engines, breweries, and other public works, and for watering the streets, we are of opinion that a considerable revenue would be derived from the application of water engines for a great variety of purposes. Small steam-engines would, to a certain extent, be given up, and water engines used in their stead, thereby diminishing the smoke nuisance, or they might be used where steam-engines are prohibited. The engines could be supplied through a meter, so that it might be used for an hour or two without any trouble or loss. If the source of supply be

sufficiently elevated, the use of fire-engines could be dispensed with. Gorbals has 225 feet, Stirling 450 feet, and Kilmarnock 270 feet of head pressure, with the pipes constantly charged. Fire-plugs might be placed on both sides of the streets, at the distance of a hundred yards apart, so that, by the application of a hose, fires may be extinguished in a very short time,—in many situations, before the engines and water-butts could be brought into operation. The streets might also be watered from the same openings, and the present watering carts dispensed with.

The gravitation system is now becoming very general, being found much superior to any other. At present Edinburgh, Gorbals, Paisley, Stirling, Kilmarnock, New York, Liverpool, Manchester, Dundee, and Dumfries are all supplied, or in course of being supplied, on that system.

Where at all practicable, except for perpendicular pipes, lead pipes should not be used.

The supply of water ought to be in the hands of the corporation. At present, during the prevalence of epidemics, the corporation are obliged to pay for the water used to wash out lanes and closes.

In a sanitary point of view, the work is only half done unless a complete system of drainage be adopted.

In this report allusion has at different times been made to the establishment of a board, under whose management the various arrangements for carrying out the sanitary improvements of the city should be placed. Whether that board should be a distinct one from any existing municipal court, or what should be its constitution, we do not feel called on to give any judgment.

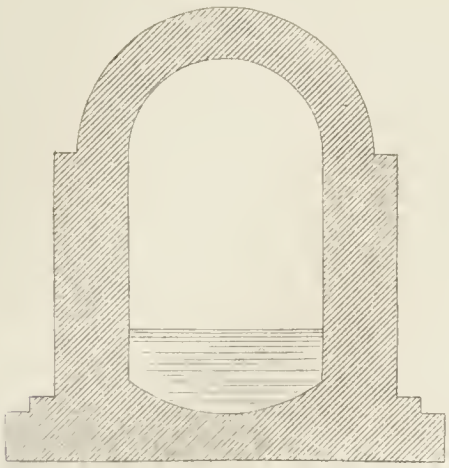
There can, however, be but one opinion as to the importance and necessity of having the great evils under which we are at present placed arrested and remedied, and their future perpetration prevented. Without such an authority, the

mere utterance of any opinion, or the laying before the public any suggestions, however good they may be, will never be any guarantee for the successful and universal adoption of remedial measures. These cannot be left to the discretion or whim of parties interested. Nor will such parties have any grievance to complain of. They will be placed on the same footing as their neighbours. They will together be promoters of the public good, and will inevitably find, that whatever is conducive to the public good subserves their own interests. There is no hardship to any one in particular, if all parties are compelled to shew how they intend to lay off their grounds, how they propose to ventilate and drain their houses; but, on the contrary, in all this there is an enormous amount of beneficial results secured to the whole community.

The wise administration of such remedial and preventive measures, with the concurrence and coöperation of all parties, may yet redeem our city, even in our day, from occupying the most unenviable position of having probably the highest rate of mortality of any city in the empire, and of seeing it raised to the proud eminence of being not only a great commercial city, but at the same time one of the most salubrious and healthy; and thus, by every man caring not for his own, but for the things of his neighbour, the Christian minister will find his labours appreciated, and his hand strengthened, when he is called to labour, not amongst a population living like the neglected off-scourings of society, but elevated to the enjoyment of comfortable home and fireside endearments.

Thus shall we, under the Divine blessing, advance one great onward step in rescuing the masses from the depressed and degraded state in which they have too long been allowed to remain.

CHARLES WILSON,<br>
J. T. ROCHEAD,<br>
JOHN HERBERTSON, } *Conveners.*



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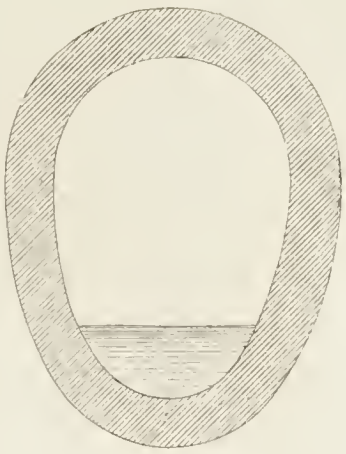

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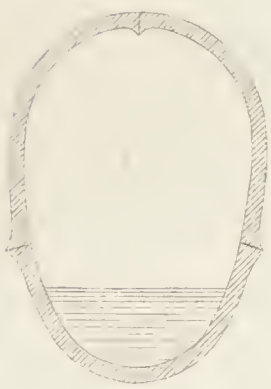

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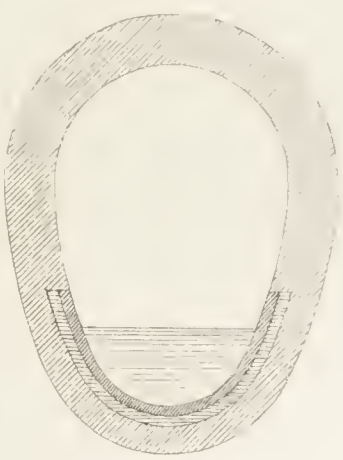

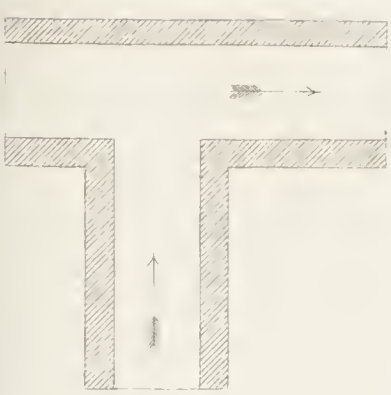

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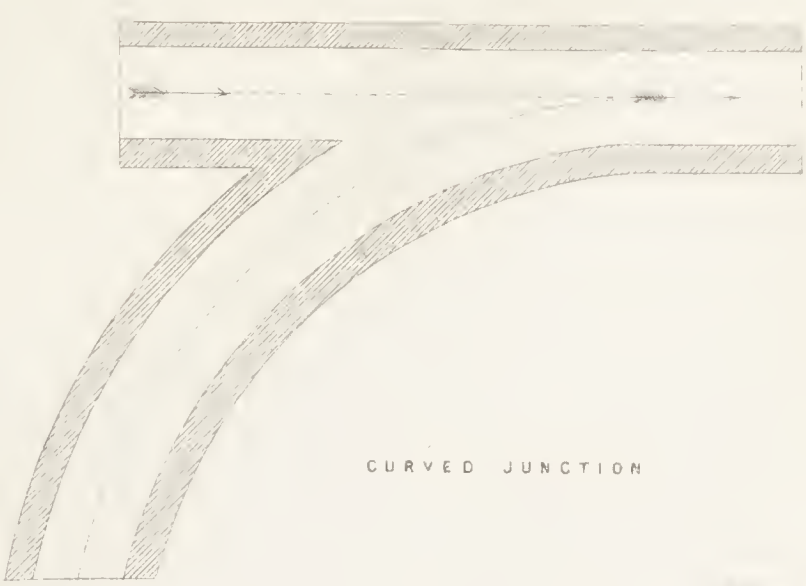

CURVED JUNCTION

Transactions of the Architectural Institute of Scotland.
Session 1851–52.

# No. IV.

# ADDRESS

DELIVERED AT THE FIRST MEETING IN ABERDEEN OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND.

(8th January 1852.)

BY

ALEXANDER FORBES IRVINE, Esq.
YOUNGER OF DRUM.

Gentlemen,

We had hoped to assemble on the present occasion under the auspices of one of our Vice-Presidents, whose position in this county, not less than the interest which he has displayed in matters relating to the science, would rightly have entitled his opinions on architectural subjects to much consideration and respect. Circumstances have prevented his attendance, although I know that he continues to feel an interest in our welfare; and while I trust that our next meeting in this place may be under the presidency of the Earl of Aberdeen, I proceed to discharge the duty imposed on me, of explaining very briefly the origin, the nature, and the objects of the Architectural

Institute of Scotland, the intentions of its founders, and the manner in which these intentions have hitherto been carried into effect.

To many of those here present, who have tended the Institute from its infancy, who have assisted us by their valuable advice, and who have cheerfully and unhesitatingly placed at our disposal that time which they could ill afford to borrow from other and laborious occupations, I am sensible that no such explanation is required; but on the occasion of our first meeting in this city, I may be permitted to state to those who may not as yet have joined our ranks, the general nature of the Association.

The Architectural Institute of Scotland is now in its Second Session. The objects contemplated in its formation were generally these:—The advancement of the art and science of Architecture; its past history and theoretical principles; and the manner in which these principles are developed and applied in practice. The subject, it will be admitted, affords sufficient scope for inquiry; and accordingly the published volume of our Transactions, to which we may be permitted to refer as some earnest at least of our future labours, comprises contributions of various interest on the history, theory, and practice of the art. In the historical department, I need only refer to the accurate 'Notes of early Scottish Architects,' contributed by a Member of our Council; and which will in due time be followed by the publication of a paper by Mr Laing on the subject of the Architect of Heriot's Hospital, Edinburgh, and in which that oft-debated question is now, I think, practically set at rest. The papers on the Architectural Features of Edinburgh and on the Curves in Grecian Architecture may be referred to what, in default of a better term, I must designate by the new and rather affected description of the æsthetic de-

partment of the science,—that which seeks to discover and apply the theoretical principles of beauty in Architecture. In the essays on the construction of cottages for the labouring classes we have indications of the practical utility of the art, which, while it can design the majestic pyramid of Egypt, or the vast cupola of St Peter's,—the work of the great architect who raised the Pantheon in the air,—' of him who pillar'd to the ' Gods of Rome a new Olympus,'—does not deem it unworthy of her to descend to the construction of the humblest cottage. So it is, indeed, with all true science;—it experiences no degradation in its practical applications; and Astronomy, the sublimest and most perfect of all, having measured the vast distances of the remotest stars, and weighed, as it were, the earth in a balance, descends to fulfil the requirements of earth's inhabitants, and to afford to the mariner a sure and unerring guide across the pathless ocean.

One other object of the Association, and one of no ordinary importance, remains to be noticed,—I allude to the proposal for founding at some future, but, I trust, no distant period, a Professorship of the history and theory of the art. This formed a prominent feature in the original idea of the Institution, and I hope the time has now arrived when we may be enabled to carry it into effect. No other means appear so well fitted to advance the standard of knowledge and of taste in Architecture throughout the country generally; and, after all, it is to the elevation of public taste that we must look for any beneficial effects of a permanent character. As the public is the employer, so is the public opinion in this, as in more important matters, the great and final court of appeal; and to the elevation of that taste, by whatever means attained, we must eventually owe the improvement of our national edifices.

While, however, I would thus explain very briefly the

nature and objects of the Institute to those who may yet be strangers to its history and objects, I should, I think, be wanting in an important part of my duty, did I not, in name of the citizens of Aberdeen, tender a hearty welcome to those members who have come from a distance to take part in our proceedings. Our Cross, indeed, no longer 'aboundantlie runs 'wyne,' even in honour of a Royal visit, and I fear the custom of pledging each distinguished visitor in a 'cup of Bon-'Accord' is now, like many other usages of the good old times, practically in desuetude; but I trust we have not yet utterly lost all claim to those 'civill inclinations' for which, nearly two centuries ago, a local chronicler gave us credit,—'The 'like,' he adds, *i.e.*, the civil inclinations, 'not easie to be fund 'under so northerlie climats, damped, for the most pairt, 'with air of a grosse consistance.'* Perhaps in default of more substantial means of evincing our welcome, I may be permitted for a few minutes to assume, however unworthily, the office of '*Cicerone*,' and point out to our visitors of to-night a few at least of the more remarkable objects of the town and neighbourhood. The subject, indeed, has been so skilfully and so industriously handled by our numerous local historians that little of novelty is now to be expected—the labours, especially of the Spalding Club, having elucidated many interesting points in our antiquarian and topographical history.

The meetings of the Architectural Institute have as yet, I believe, been held exclusively either in the Scottish capital, or in the great commercial metropolis of the west. Without possessing the commanding advantages of natural situation, in which Edinburgh is perhaps without a rival, and scarcely competing with the enormously extended commerce of the Clyde, and the engrossing industry of the manufacturers of Glasgow,

* A Description of both Touns of Aberdeen, by James Gordon, printed for the Spalding Club, p. 3.

the city of Aberdeen boasts of an antiquity superior to most of its Scottish rivals. I fear, indeed, that we must resign the once fondly-cherished fable of the identity of Aberdeen with the Roman Devana,—the latter being now, by the industry of Chalmers, and subsequent antiquaries, sufficiently identified with another site; and it may be that we must assign to the same cause—the universal desire of local historians to connect the early history of their city with ages long gone by—the story of Aberdeen having received its immunities as a burgh from Gregory the Great, king of the Scots, in the year of Christ, 876. Still, sufficient remains behind. 'The most ancient of our burghs,' writes a distinguished antiquary of the present time, 'cannot date 'their privileges higher than the age of David, the father of 'his people, no less than of the Church; nor support their 'individual claims by charters earlier than the reign of his 'grandson William. With the most ancient, as well as the 'most important, ranks the burgh of Aberdeen. Long before 'Edinburgh had acquired the dignity of a capital, or even the 'first place among the four burghs of southern Scotland—'while Glasgow was yet an insignificant dependent on its 'bishop—Aberdeen had taken its place as a great and independent royal burgh, and a port of extensive foreign 'trade.'*

In commencing our survey, the prominence of the principal church in the general view of the city is but one of many reasons for the preference being accorded to it. At what precise period the earliest church was here consecrated to St Nicholas, the patron saint of the burgh, does not seem to have been accurately ascertained. Its antiquity, however, is considerable. It appears to have been in a flourishing state in the thirteenth and fourteenth centuries; and numerous

* Description of both Touns, Preface, p. viii.

chantries and alterages were instituted by benevolent founders. 'At the epoch of the Reformation,' says Kennedy, 'it was 'regarded as one of the handsomest parish churches in Scot-'land. It was built in the Gothic style, and the dimensions 'of its nave, the roof of which was supported by eight columns 'on each side, were 117 feet of length, by 66 feet of breadth, 'including the side aisles. There were six galleries in it, 'three on each side, the fronts of which, and of many of the 'pews in the body of the church, were constructed of black 'oak, having various emblematical figures neatly cut in re-'lievo.'* About the beginning of the eighteenth century the church became ruinous and unserviceable, and was abandoned as a place of worship in 1732. Ten years afterwards, the whole fabric, we are told, fell to pieces, and was only replaced in the year 1751 by the building now known as the West Church. The exterior of this edifice possesses little that is attractive, but the interior, with its strong square pillars and circular arches, is not destitute of a certain massive and imposing solemnity. It is farther remarkable as having been executed from a design gratuitously furnished by the well-known architect James Gibbs, and forming, so far as I am aware, his only contribution to the architecture of his native town. It has been customary to estimate rather lightly the merits of Gibbs. 'Without deviating from established rules,' says Walpole, 'he proved that mere mechanical knowledge may avoid 'faults without furnishing beauties; that grace is not depend-'ent on rules; and taste not to be learned;' and his architectural works are challenged by the same popular critic as deficient in 'the harmonious simplicity which marks genius.' These are hard terms; but Walpole's is not the only instance in which the desire of epigrammatic composition has led to the neglect of truth in criticism. Gibbs, it is true, cannot

* Kennedy's Annals of Aberdeen.

claim the palm of great original genius, but he is entitled to a highly respectable position among the architects of that age, and many of the faults which have been charged against the public buildings executed under his superintendence appear to be more justly referred to the *quasi*-classical style of architecture then generally adopted—a style possessing neither the simple majesty of the Grecian, nor the imposing magnificence of the pointed architecture.

The East Church occupies the site of what was once the choir of the Old Church of St Nicholas. Its erection was commenced in 1477, and, proceeding very tardily, was not completed till 1507. The Old East Church, as it was termed, and as it stood till a very recent period, is described as having been a 'neat Gothic building, entirely divested of 'ornament or carved work. It was 86 feet of length to the 'breast of the chancel, and 64 of breadth, including the side 'aisles. The roof of the nave was supported by four arches 'on each side, which sprang from Gothic columns without 'any ornament. Under the chancel, which was 18 feet by 12, 'was a neat chapel dedicated to the Virgin Mary.'

The building now described has lately been superseded by a modern structure, the interior of which presents the usual heavy galleries, supported by slim cast-iron pillars, which unfortunately distinguish the Church Architecture of recent times, and neither requires nor deserves particular notice.

But by far the most ancient portion of the church now remaining, as it is also by much the most interesting, consists of these aisles, one of which is known as Drum's Aisle, while the other derives its distinctive name from that of a family of Collisons, of some repute in burgh history. In the former of these, indeed, recent restorations, as they are termed, have left but few characteristic features. Paint and plaster, divided by lines so as to imitate aslar work, in defiance of

taste and of Ruskin, have modernized the aspect of Drum's Aisle; but the other portion of the transept is particularly worthy of careful and minute observation, owing to the existence of certain Romanesque features particularly observable in an old doorway, entering originally into what is now the West Church, and also, although of later date, in the four tall pillars which support the spire. All these remains will, I trust, be more minutely examined and described by some skilful member of the Institute.

To pass for a time from ecclesiastical to secular buildings, the attention of the spectator can scarce fail to be arrested by the prominence of the Market-Cross. Although without pretension to vie with the magnificent Queen Eleanor Crosses and structures of a similar character with which England abounds, it is undoubtedly the finest example which Scotland possesses. The present building replaced the old cross, from which many a proclamation had been made during the troublous times of Scottish history. If the semi-classical style which characterizes its architecture be amenable to criticism, yet if it be, as is generally supposed, the design of a country mason, the edifice must be regarded as highly creditable to his taste and skill. The records of the town for the year 1686 bear evidence of a payment of 1800 merks, or about £100 sterling, on account of the building of the market-cross to John Montgomery of Old Rayne, the ancestor, as I imagine, of a long line of hereditary masons, who are interred by the old parish church of Auchindoir, whose little Norman doorway, and some other peculiarities, are not unworthy of notice among the minor ecclesiastical antiquities of the county.

The principal bridges in Aberdeen are only two in number. Of these, one is of ancient, the other of modern date. The bridge of seven arches which spans the river Dee forms

a venerable and not unpicturesque object, and, till superseded by the all-conquering rail, constituted part of the principal line of communication with the south of Scotland. It owes its foundation to the excellent Bishop Elphinstone, although it was not finished till the episcopate of his successor, Bishop Gavin Dunbar. A deed of agreement is still preserved, by which, on the completion of the work, in the year 1527, the latter prelate made over to the Magistrates and Town-Council certain lands of Ardlair to provide for its future maintenance and repair. The trust has been well fulfilled. The old bridge shows few symptoms of decay, and having been recently found too narrow for the increasing traffic, has been skilfully widened, its peculiar character remaining in a great degree unimpaired.

The only other bridge which I shall notice, as connected with New Aberdeen, owes its construction to the genius of Telford, and forms one of the many instances of that skill which raised the stone-mason of Eskdale to the highest eminence in his profession as a scientific engineer. During the year 1801, and while carrying out those plans of improvement which resulted in the formation of the magnificent approach to the town now known as Union Street, it became necessary to arch over the hollow or ravine through which flows a small streamlet called the Den Burn. A scheme had been prepared for spanning the valley by three insignificant arches, when fortunately Mr Telford, who happened to pass through the town, was consulted by the promoters. Viewing the capabilities of the native granite, he prepared a plan which would not only have strikingly exhibited the excellency of that material for the purposes of construction, but would have adorned the city with a bridge of 150 feet span, the largest in the kingdom. Motives of economy, however, interfered; a simpler design was obtained; and, in order to

take advantage of some parts of the buttresses which had been already built, the span was reduced to 130 feet, the rise of the arch being 29, and the breadth across the soffit 43. Although thus shorn of the gigantic proportions originally intended, it is still a noble span—with one exception, the Bridge of Taff, in Glamorganshire, the greatest of any stone bridge in Britain; and one cannot help wishing that a touch of the magic wand of the enchanter would bring under it the channel of either of the two kindred rivers, instead of the filthy and uninteresting streamlet which here flows confined between its formal banks.

Many buildings of minor importance might here claim a notice, did time permit. Some picturesque houses in the Schoolhill have been made known by the accurate pencil of Mr Billings; and the architectural visitor ought not to neglect the singular building known as Wallace Nook, although I fear that the origin of the name, and the history and destination of the building, involve questions of which I am unable to offer any satisfactory solution.

In these slight and desultory notes on the public buildings of Aberdeen, I have limited my remarks to the works of the architects of past ages. I must not, however, omit noticing one whose professional career has but lately closed, and to whose taste and genius Aberdeen is indebted for many of its most remarkable architectural features. To those who are acquainted with the recent history of the city, I believe it will be unnecessary to say that I allude to the late Mr Archibald Simpson. His earliest work of importance is, I think, St Andrew's Church, King Street; and it appears to me to be highly creditable, if we consider the period of its erection. When Mr Simpson's architectural practice commenced, the revival of pointed architecture had scarcely begun. One point is remarkable,

that, in that revival the English Perpendicular style should have been so generally adopted, more especially as no authenticated instance of its use, so far as I am aware, is to be found in our native architecture. Some portions, indeed, of Melrose Abbey have been thought to present some resemblance to that style, a matter easily and satisfactorily accounted for by its proximity to the English border. But, on the whole, I believe the indigenous Scottish Architecture bears much more strongly the impress of the French Flamboyant than of the style which prevailed in England during the same period—a circumstance which, with many others, bears witness to the close connexion which long subsisted between the kingdoms of France and Scotland. Not, indeed, that I would apply to the English Perpendicular the epithet 'detestable,' which has been conferred on it by a distinguished critic and member of our Institute. I would willingly forgive it much,—more even than I think it requires—were it only for the sake of that delicate and exquisite fan-tracery which it developed and carried to perfection. It is now, however, very generally admitted that it is neither the most perfect nor the most appropriate of the Pointed styles, and I think there is little difficulty in perceiving a marked and growing preference for the earlier architecture.

But I return from this digression. The buildings which Aberdeen owes to the genius of Simpson are considerable in number and various in style. The Infirmary, a tasteful and elegant classical structure, is so secluded, that it requires the tourist to set out purposely in search of it. The new Marischal College, occupying the same site as the old building founded by Earl Marischal in 1593 on the ground which had belonged to the order of Franciscans, is similarly obscured, and although the change would in-

volve the sacrifice of some old houses of considerable picturesqueness and of some local interest, it is difficult to restrain the wish that the day may come when the buildings of the College may be thrown open to the Broadgate. The spacious and elegant new market place will repay the inspection of the architectural visitor; while the tall and gracefully tapering spire of the Free Churches in Belmont Street, one of the latest works of the architect, is also one of his most successful, forming unquestionably the most elegant spire which adorns the town. Even the colour of the somewhat unusual material is not without its advantage, and when mellowed and subdued by the rust of ages, its warm tint will contrast effectively with the prevailing coldness of the native granite.

Nor should the architectural tourist close his rambles without visiting the quiet and secluded precincts of the rural town now known as Old Aberdeen—having long since exchanged for that designation its more ancient name of the Kirkton of Seaton. Earlier than the constitution of Aberdeen as a burgh, 'was the foundation of the pretty rural village 'that existed even before the settlement of the Cathedral at 'Old Aberdeen.'* After the lapse of centuries it still retains much of its mediæval quiet and solitude, and forms, in this respect, a striking contrast to the trade and bustle of the busy commercial city where we are now assembled. There, above the tops of the patriarchal trees, rise

> 'The distant spires, the antique towers,
> 'That crown the wat'ry glade.'

There, too, as at the poet's much-loved Eton, 'grateful science' rears an enduring monument to the name of a royal patron, and to the still more solid munificence of the good Bishop Elphinstone. He lies interred within the classical precincts of his own

* Gordon's Description of both Touns, Preface, p. viii.

University. The buildings of the King's College commenced as early as the beginning of the sixteenth century, and, since altered and augmented at various subsequent periods, afford, in the great spire, so nearly resembing that of the Cathedral Church of St Giles in Edinburgh, and in the Chapel, with its excellently carved miserere-seats, matter for much interesting and useful examination. A catastrophe befell the original spire. The faithful chronicle of Spalding contains this note, under the date 7th February 1633 :—' Hideous winds' —' the like had never been seen in these parts.'—' It threw ' down the stately crown, bigged of curious eslar work, off ' the steeple of the King's College of Old Aberdeen, which ' was thereafter re-edified, and built up little inferior to the ' first.'

Not far removed from this ancient seat of learning is the Cathedral Church dedicated to St Machar. Tradition records that the saint was enjoined to proceed on his journey of conversion until he should arrive at a point where the windings of a stream, as it joined the ocean, assumed the form of a crozier, and that there he was to cease his wanderings, and found his church. The value of the legend may be doubted, but unquestionably the situation bears evidence to the regard for surrounding scenery which distinguished the churchmen of the earlier ages in fixing the positions of their cathedrals. The church itself is architecturally interesting, as exhibiting the permanency of the material of which it has been constructed. The present building is said to have been founded by Henry Cheyne, Bishop of Aberdeen, in the year 1320, and to have been carried on by Bishop Alexander Kininmont in 1333. We are told that Bishop Henry Leighton, who held the episcopal see from 1424 to 1442, raised the walls to their just height, and built or rather finished those twin steeples, which, after the lapse of centuries, retain their sharp-cut

angles, as if the stones had but yesterday left the hands of the workman. One very remarkable effect of the obduracy of the granite remains to be noticed, and is here particularly displayed, viz. the extreme simplicity thus enforced on the architectural character of the edifice. The principal portions belong to the Decorated age ; while they, in many instances, display a degree of simplicity, and even sternness, more in character with the Norman period.

The two principal bridges of New Aberdeen have been already noticed, but one more venerable, and far more picturesque than either, here spans, with its fine Gothic arch, the sullen waters of the Don. The Bridge of Balgownie also enjoys the rare merit of having been celebrated in song by poets of different times. The traditional rhyme which attaches to it is familiarly known in the neighbourhood, although, to judge from the strength of the old bridge, the catastrophe which it predicts is as improbable as ever—

> ‘ Brig o’ Balgownie, wight is thy wa’,
> ‘ Wi’ a wife’s ae son, on a mare’s ae foal, down shalt thou fa’.’

Arthur Johnstone, the author of many verses that dispute the palm of Latinity with Buchanan, has celebrated the spot where

> ‘ Amnis aquas uno pons admirabilis arcu
> ‘ Integit, autores suspicor esse Deos.’

And the lines in which Byron has sung the Bridge of Balgownie, and the boyish recollections which were recalled by the mention of its name, are probably well known to most whom I now address—

> ‘ As Auld Lang Syne brings Scotland, one and all,
> ‘ Scotch plaids, Scotch snoods, the blue hills and clear streams,
> ‘ The Dee, the Don, Balgownie’s brig’s black wall,
> ‘ All my boy feelings, all my gentler dreams,

'Of what I *then dreamt*, clothed in their own pall,
'Like Banquo's offspring; floating past me seems
'My childhood in this childishness of mine;—
'I care not—'tis a glimpse of 'Auld Lang Syne.''

We have lately heard something of projected improvements on the bridge, or at least on the approaches to it. Into the merits of the precise changes recommended I do not wish here to enter, but I may be permitted to express at least a fervent hope that no rude hand may ever be raised to impair the picturesque character of the venerable structure. Writing of a proposition of a different character, which once boasted its advocates, a local tourist declares that the memory of its supporters 'deserves to be execrated to the latest posterity.'* I should be tempted to invoke the same architectural anathema on all who would lay ruthless hand on the old 'Brig o' 'Balgownie.'

* Description of the East Coast of Scotland, by Francis Douglas.

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## No. V.

# ESSAY ON THE NATIONAL MONUMENT OF SCOTLAND.

BY

GEORGE CLEGHORN, Esq. of Weens.

[*Read at the Meeting of the Institute in Edinburgh on the 29th January* 1852.]

The following Essay, for the sake of perspicuity, is divided into three parts:

Part I. comprises a Historical Sketch of the National Monument from its commencement up to the present time, with the causes of its failure.

Part II.—Remarks on the Ancient and Modern state of the Temple of Minerva or Parthenon, on the Acropolis of Athens, embracing its Architecture, decorative Sculpture, and arrangement of the interior, with the opinions of the most eminent writers on the subject.

Part III.—The Restoration of the Parthenon as the National Monument of Scotland, with its intended Plans and Decorations, shewing the great advantages resulting from its completion, and combating the objections started by the Quarterly Reviewers, and certain Artists and Amateurs in London, against the erection of the National Monument.

## PART I.

It is now more than thirty years since the National Monument was first projected. Some time elapsed before any definite plan was fixed—some suggesting a modern church—some a Roman triumphal arch—others a Gothic edifice. At length a few public-spirited individuals of more refined taste, proposed that the restoration of the Parthenon of Athens would be the most eligible, and that the Calton Hill, from its resemblance to the Acropolis of Athens, should be chosen as the site. This proposal, which at first encountered violent opposition, gradually gained ground, till at a general meeting of subscribers a resolution to that effect was carried by a large majority. Several subscribers, however, of the minority threatened to withdraw their contributions unless a church was adopted, under the pretext that they were led to suppose they were to obtain a right to pews in proportion to the amount of their subscriptions.

In the meantime it was resolved by the subscribers to apply for an Act of Parliament to enable them to carry out their views. After considerable difference of opinion as to the conditions of the bill to be presented to Parliament, it was at length announced 'that a meeting of the committee of 'subscribers to the National Monument (to whom full powers 'had been given to adjust the clauses), held at London the '24th of April 1822, had resolved, in unison with the origi-'nal views and intentions of the subscribers, to insert a clause 'in the bill, making it imperative that the structure should 'comprehend a place of divine worship, where the subscribers, 'and also his Majesty's forces, both soldiers and seamen, in 'and about Edinburgh, might be accommodated, with an 'option to construct cells for sepulture in the vaults beneath.'

This ill-judged, and as it turned out, ill-fated compromise, was brought about for the double purpose of securing a grant out of the funds set apart by Parliament for building churches, as well as retaining the support of the dissentients, who constituted a small minority of the subscribers. But so far from such a clause being in unison with the original views and intentions of the subscribers, as alleged by the committee, the great majority, consisting of men of rank and fortune, never contemplated such a heterogeneous combination as that of a church with a National Monument. They gave their support to the undertaking on the understanding that the structure was to be, not merely in name but in reality, a National Monument, identified with British and Scottish achievements, and fitted to create an interest among all classes of the community. The bill incorporating the contributors into the Royal Association for the erection of the National Monument passed both Houses of Parliament, and received the Royal assent in 1822.

Lord Binning brought the subject before the House of Commons by presenting a petition, praying that a sum of £10,000 might be granted in aid of its erection, out of the funds set apart for building churches. Sir George Clerk supported the petition, and stated, as a recommendation, that it was the intention of the committee that a large proportion of the seats, gratis, should be retained for the use of the public. It was observed by some members who opposed its reception, that it could not be expected the people of England and Ireland, already borne down by distress and taxation, should be burdened still more for the purpose of raising a National Monument for Scotland—much less under the plausible pretext of erecting a place of worship; for, had that been their real object, it would have been incumbent on them, instead of applying £10,000 to

the partial construction of a very costly and ornamental structure for the embellishment of the city of Edinburgh, to expend it in building several plain churches, equally, if not better suited, to every purpose of religious worship. Mr Gurney opposed the grant, 'because he thought the building, under such circumstances, would turn out a poor, 'meagre, and miserable imitation of the Parthenon.' Thus did this compromise, like all half measures, fail in both objects. It disgusted the nobility and aristocracy, who formed a large proportion of the subscribers, and ultimately alienated them from taking any interest in the undertaking. It did not satisfy the dissentients; nor did it succeed in obtaining the Parliamentary grant, for which so great a sacrifice was made.

The foundation of the Monument was laid the same year the Act was passed, by Commissioners specially appointed by his Majesty George IV., as patron and founder, with every circumstance of pomp and pageantry, amidst the cheering and enthusiastic exclamations of countless multitudes. Innumerable meetings were held, and speeches made, breathing the most fervent loyalty, patriotism, and zeal for the success of the Monument. The journals of the day teemed with appeals to our countrymen, both at home and abroad, to unite in forwarding this great national object. It occupied entire articles in the Quarterly and Edinburgh Reviews, in Blackwood's and the Edinburgh Magazines. But no sooner had the first burst of excitement passed off, than serious doubts began to be entertained, both by the subscribers and the public, how far the scheme of making the building comprehend a place of divine worship, with cells for sepulture beneath, was consistent with a restoration of the Parthenon, or its destination as a National Monument, embracing sculptural and pictorial decoration. Nor did the summit of the Calton Hill appear particularly well suited to

an ordinary place of worship, inaccessible as it is to carriages of every description.

The Royal Association and their directors continued to hold annual and statutory meetings, and to address urgent appeals to the public. But it was all in vain. The enthusiasm had subsided, and given place to disapprobation and indifference. Even those who would have become contributors had the structure been conducted on a classical and national plan, were disgusted with the narrow views and bad taste of those who took the management. It had more the appearance of a job for building a church for the members of the Association and inhabitants of Edinburgh, than a National Monument identified with Scotland. Nor is there any wonder, under such circumstances, that the public, more especially Episcopalians, Roman Catholics, and all sects of dissenters, as well as our countrymen in the Colonies, should have ceased to feel any interest, much less enthusiasm, in the undertaking. The contributions languished, and soon altogether ceased. In this dilemma a scheme was proposed for raising supplies, which, after some hesitation, was sanctioned by the Association, namely, in accordance with the discretionary power vested by the Act, they resolved to lay out the vaults for sepulture or dormitories, and by their immediate sale to realize a fund for prosecuting the building. Plans of these dormitories, consisting of some hundred cells, were publicly exhibited, and advertised in all the newspapers, under the imposing title of 'The Grand National Cemetery, authorized 'by Act of Parliament.' As an inducement for families to become purchasers, the advertisements dwelt 'on the abso-'lute and most perfect security which it would afford against 'any attempt to disturb the dead, and the pious desire which 'many families in Scotland must feel to have the remains of 'their illustrious ancestors deposited under the spot where

'their honourable names are to be inserted, and their noble 'deeds recorded by a grateful posterity.'

Supposing such cells could have been executed without risking the stability of the structure, and waiving the indecency and absurdity of transforming a National Monument into a mercenary jobbing speculation, it was the height of imprudence and folly to attempt disposing of the cells by anticipation before the building was begun, thus involving the Association in rash contracts, the fulfilment of which depended on contingencies altogether beyond their control. Moreover, how could honour or distinction attach to cells put up indiscriminately to public sale? Not a single offer was made. The project utterly failed, and it was fortunate for the association that it did fail. Indeed, had it been the object of the directors to bring the National Monument into ridicule and contempt, they could not have devised more effectual means.

Annual and statutory meetings were still announced, but so thinly attended as hardly to form a quorum. Matters remained in this hopeless state for some years, when it was at length intimated, on the part of the committee of directors, that they had resolved to commence the building, and to proceed with it as far as the funds at their disposal, which did not exceed £16,000, would admit. It was accordingly begun, under the able superintendence of Mr Playfair, from plans furnished by Mr Cockerell, until the above sum was exhausted in raising the basement and twelve columns of the western front. These columns, now a modern ruin, have long been, and still are, a jest and a byword—an object for the finger of ignorance and scorn to point at. Yet, desolate and imperfect, despised and neglected, as they now stand, viewed as an example of the purest Grecian Doric on its full scale of magnificence, and executed in massive blocks of superior masonry, they

are unparalleled in Great Britain, not to say in modern Europe.

Never perhaps was a great national undertaking, to all appearance, commenced under more favourable auspices than the Scottish National Monument, if numerous lists of the high and the titled, the influential and wealthy of all ranks, from Royalty downwards, can be deemed any security for success. On referring to the act incorporating the Royal Association, we find the following noblemen heading the list: —Five Dukes: the Duke of Buccleuch and Queensberry, the Duke of Gordon, the Duke of Atholl, the Duke of Montrose, and the Duke of Wellington. Three Marquises: Stafford, Bute, and Huntly. Fifteen Earls: Eglintoun, Moray, Strathmore, Kellie, Haddington, Elgin and Kincardine, Wemyss and March, Dalhousie, Aboyne, Breadalbane, Stair, Rosebery, Glasgow, Hopetoun, Fife. One Viscount: Melville. Ten Lords or Barons: Forbes, Saltoun, Gray, Colville, Belhaven, Rollo, Abercromby, Lynedoch, Douglas, and Glenlyon. Then follow the Right Honourable William Dundas; the Right Honourable Sir John Sinclair; the Right Honourable Sir William Rae, Lord Advocate; the Right Honourable Charles Hope, President of the Court of Session; the Right Honourable David Boyle, Lord Justice-Clerk; the Right Honourable William Adam; and the Right Honourable Sir William Grant, succeeded by eight Lords of Session, one Baron of Exchequer, twenty-four Baronets, nine Knights of different orders, a long list of military and naval officers, including country gentlemen, physicians, doctors of divinity, professors, merchants, &c., and, to crown the whole, his Majesty George IV. was patron and founder, and the Duke of Buccleuch, Duke of Montrose, and Duke of Wellington were presidents. Many others, including noblemen and men of rank, subsequently became members of the association. Such was the high patronage of the

National Monument, which was rendered utterly abortive by the mismanagement of the London Committee.

The association continued in this state of torpor and inactivity for many years till 1846, when the directors of that period, convinced of the impracticability of combining a place of worship with a National Monument and its requisite decorations, were unanimously of opinion that application should be made to Parliament for a modification and amendment of the existing act. The directors submitted their views to the general meeting, who unanimously approved of them. An amended bill was accordingly presented, which passed both Houses of Parliament, and received the Royal assent in 1848. The clause making it imperative to occupy a part of the interior as a place of worship, with a cemetery in the vaults beneath, was withdrawn. As an encouragement to become members of the Association, the £25 share by the former Act is by the amended Act reduced to £5, which entitles the holder to be a member. By the former Act it required a subscription of £50 to qualify to be a director; by the amended Act five of the reduced shares, or £25, qualify for a director, giving five votes to the holder at general meetings. A subscriber, therefore, is entitled to as many votes as are £5 shares in his subscription. As an additional encouragement, contributions to a less amount are received as donations, which, when amounting to £5, entitle the subscriber to vote and become a member of the Association. But no member can have more than twenty votes, though he may hold more than twenty shares. It is likewise enacted, that so soon as the Monument shall be completed, a special meeting of the whole subscribers shall be called to name trustees, in whom shall be vested in all time thereafter the powers and provisions in the two Acts, and the care and preservation of the Monument.

The Association having now obtained full powers, provided funds could be obtained, to raise the structure in a style of grandeur and decoration worthy of its high destination, took into consideration the plans to be laid before the public. After mature deliberation, it was resolved—1. That the exterior, as already proposed, should be a restoration or *fac simile* of the Parthenon, or Temple of Minerva, on the Acropolis of Athens, admitted by all antiquity to be the most perfect structure of Greece, and which has been confirmed by the suffrages of all nations for the last two thousand years. 2. That the eastern and western pediments, metopes, and frizes of the peristyle, should be decorated with national sculpture, in imitation of the general style and arrangement of the original. 3. That the interior should form one great hall or chamber, lighted from the roof by flat cupolas or lanterns, and communicating by vestibules with the eastern and western fronts—the great hall to be so arranged as to afford ample scope for pictorial decoration, whether in fresco, encaustic, or oil colour. 4. That as a means of conferring much additional interest and lustre, the great hall is likewise to be set apart as a Gallery of Honour, for the reception of busts and statues, not groups, of eminent men, whether statesmen, warriors, men of science, poets, artists, &c. not limited to Scotland, or even to Great Britain, but extending to all nations; it being understood that the cost of such statues or busts is to be defrayed by those who send them, while the Association reserve a discretionary power to accept or reject, but being once received, they are to be permanent. Such statues and busts will be so arranged as not to interfere with the pictorial decorations.

The amended Act, followed by the plans already alluded to, has had as yet no effect in inducing the public to come forward in support of the Monument, partly from the country

being so much engrossed with political agitation and railway speculation, and partly from the directors not having opened subscription lists, or appeared before public meetings, from an unwillingness to interfere with the completion of the Scott Monument. But now that it is completed, there is no longer any call for such delay.

## PART II.

The Parthenon or Temple of Minerva stood on the highest platform of the Acropolis of Athens. Though now ruinous and mutilated, it still remains the greatest ornament of the modern, as it did of the ancient Acropolis. It was octostyle and peripteral, with eight columns in each of its fronts, and seventeen in its sides, constructed entirely of Pentelican marble. It was built during the administration of Pericles, by Calicrates and Ictinus, under the superintendence of Phidias, on the site of a former edifice, called Hecatompedon, from its being a hundred feet square. It was of the Doric order, and has always been recognised not only as the finest specimen of that favourite order, but as the most perfect and highly adorned structure of Grecian architecture. The columns, 6 feet 2 inches in diameter at the base, and 34 feet in height, rested on a stylobate of three steps or gradations. Its total height was 65 feet. Within the portico and colonnade of either front was an interior range of columns of $5\frac{1}{2}$ feet in diameter, forming an entrance or vestibule—the eastern styled the pronaos, the western the porticum. The interior, $62\frac{1}{2}$ feet in breadth, was divided into two unequal chambers—the eastern called the cella or *naos*, 98 feet 7 inches in length—the western, the opisthodomus or treasury, 43 feet 10 inches. From the description of Wheler and Spon, it is evident

there were at that time in the interior of the cella, two rows of columns, one above the other, standing at a certain distance from the walls. The Greeks, after their conversion to Christianity, occupied it as a Christian church, and covered it with a roof and cupolas, according to the taste of the times. It was afterwards transformed by the Turks into a Mahommedan mosque. Wheler describes the temple when a mosque, and, according to Mr Wilkins, has confounded the modern additions made by the Greeks and Turks with the remains of the ancient edifice. Stuart and Chandler, he thinks, have in some degree exposed themselves to a similar imputation.*

When Sir George Wheler and Spon visited Athens in 1676, it was comparatively in good preservation, both in its architecture and sculpture. The present state of dilapidation was caused chiefly by the bursting of a shell within the temple during the bombardment of the Acropolis by the Venetians in 1686, under the command of Morosini and Koningsmark. The explosion took place in the centre of the cella, levelling to the ground a great part of the walls opposite to the opisthodomus, six columns of the peristyle on the south side, eight on the north side, including five columns of the pronaos. The eastern portico suffered little, but the pediment and sculpture were much damaged. The western pediment escaped the effects of the explosion; yet most of the statues described by Wheler and Spon are no longer to be found. Morosini attempted to remove one of the principal groups, but, whether from accident or unskilfulness, it fell to the ground and was shattered in pieces. Fortunately for England at least, the Earl of Elgin was more successful in such operations—though nothing but the con-

* Wilkins' Topography of Athens, Note, p. 105.
Chandler's Travels in Greece, pp. 48, 49.

viction that, sooner or later, these *chefs-d'œuvre* were doomed to destruction, could have warranted so cruel a spoliation.

Mr Stuart supposes the Temple to have been a hypæthros, namely, with two ranges of columns of two stories in the interior, dividing the cella into a nave and two aisles, the nave being uncovered and open to the sky. Mr Wilkins, however, contends that the Parthenon is not the building to which Vitruvius alludes, and if so, the foundation on which Mr Stuart rests his hypothesis being removed, there remains only the testimony of Wheler, which, from his ignorance of architecture, is of little authority.* The particulars related in Wheler's description of the interior of the building—namely, the canopy supported by porphyry columns, with Corinthian chapters; the double peristyle of the galleries; arches supporting columns; the semicircular form of the holy place, to which light was admitted from the east, and separated from the rest by jasper columns—indicate the productions of a later age. In a memorandum by Mr Walpole, from information furnished by M. Fauvel, a French artist, who devoted many years to the study of Athenian architecture and sculpture, there is a positive assertion that the interior columns of the Parthenon, of which several portions then existed, were of the lower Greek empire. Stuart has introduced a peristyle of columns, one above the other, into his plan of the interior, as having formed a part of the ancient building. He considers the circumstance of the floor next the walls being a little raised above the level to favour such an idea. But, on the other hand, the hypæthral Temple of Pestum has the floor of that part lower than the rest. The dimensions of the columns, ascertained from the marks of the lower range still remaining on the pavement, and corres-

* Wilkins' Topography of Athens, p. 99. Wilkins' Antiquities of Magna Græcia, Introd., p. 8.

ponding with the fragments lying in the cella, present, in Mr Wilkins' opinion, an insuperable objection to the internal peristyle having been a hypæthros. He objects to Stuart's plan of the cella and opisthodomus as destitute of authority and probability. He expresses his decided conviction that no columns existed within the opisthodomus.*

Colonel Leake, on the contrary, in his learned and elaborate work on the topography of Athens, guided by the researches and authority of Mr Cockerell, coincides, to a certain extent, with Mr Stuart, in supposing the Parthenon to have been a hypæthros. He is of opinion that the ceiling of the opisthodomus was supported by four columns, about four feet in diameter; while Stuart assigns six columns to the opisthodomus, and twenty-six to the cella. The order of the different columns is unknown. Those of the opisthodomus, which were 36 feet in height, are supposed by Colonel Leake to have been Ionic. From the comparatively small size of three of the eastern division or cella, he thinks it probable that the central part of this chamber was hypæthral, or open to the sky, with the upper range of columns like the Temples of Pestum and Egina, the aisles on either side of the hypæthrum being formed by the lower range. As the interior columns of the Propylea—an edifice contemporary with the Parthenon—were of the Ionic, Colonel Leake conjectures, with much probability, that the same order reigned in the interiors of both structures; and that the upper range of the hypæthral portion may have consisted of one of the varieties of the Ionic, which, from the arrangement of the pelices and acanthus, bordered on the order afterwards known as the Corinthian.† 'It is to be lamented,' he remarks, 'that no remains of any of these are to be found, as they

* Wilkins' Atheniensia, p. 107.

† Leake's Topography of Athens, Note, p. 211.

'might have presented some new proofs of the taste and 'invention of the age of Pericles.'

Mr Wordsworth is of opinion that the peristyle was covered with a marble roof; but as regards the cella, he conjectures that it was only protected by an extensive awning or velarium, worked with embroidery. This supposition is founded on the passage in the Ion of Euripides, which has been proved to allude to the Parthenon.

In consequence of the ruinous and dilapidated state of the Temple, much of the statuary has been destroyed, and the greater part of that which remains—including that portion known as the Elgin Marbles, now in the British Museum—is so mutilated and defaced, that it is often impossible to ascertain with precision what it was intended to represent. This is particularly the case with the remains of the eastern and western pediments, which were adorned with groups of statuary of the heroic size, some of them entirely detached, emblematical of the birth of Minerva, and her contest with Neptune about naming the city of Athens. The only mode of supplying this deficiency has been to compare the existing remains, whether on the Temple or in the British Museum, with the descriptions and drawings of the works themselves, by persons who saw them when more or less entire. Those persons were—1. Pausanias, who travelled in Greece in the reign of Marcus Aurelius. 2. Carrey, who designed the sculptures of the Parthenon for the Marquis of Nointel in 1674. Unfortunately, however, these drawings are so incorrect and badly executed, that the characters of the figures are often entirely lost—added to which, all the central and principal figures of the east pediment had by that time disappeared. 3. Spon and Wheler, who described them as they existed in 1676, nearly in the same state. 4. Stuart, Revett, &c., who designed all that remained in 1752. To

these may be added the splendid drawings of Mr Cockerell, and the artists employed by the Earl of Elgin, which still remain unpublished. Even with all these aids, assisted by the able and erudite researches of such men as Visconti, Leake, Wilkins, and Wordsworth, it has been found impossible to offer a satisfactory explanation of the principal groups, or even to decide which of the two pediments contained the birth of Minerva, and which her contest with Neptune for the Attic land. On this point the theories of Mr Wilkins and Colonel Leake are completely at variance.*

Acroteria were placed at the angles of the pediments, which, it is conjectured, supported vases of gilt metal. Under the metopes of both fronts are triangular holes in the epistylium, which are supposed to have been the fastenings for suspending the golden shields, ἀσπιδας χρυσας, described by Pausanias. On the eastern front the impressions made by the rounded shields still remain on the marble. Beneath them are visible the traces of the inscriptions, which recorded the names of those by whom the shields had been worn and won. The figures of the pediments were so arranged, from the erect to the recumbent, as to fill the entire space of the tympanum. Those two magnificent compositions, consisting each of about twenty figures, were nearly eighty feet in length.

The zoophorus or frize, under the soffit of the peripterus, which crowned the exterior of the cella and its two vestibules, uninterrupted by the insertion of triglyphs, was fitted with sculpture in basso relievo, descriptive of the grand quinquennial and panathenaic procession, in honour of the goddess Minerva. The only part which remains is that over the

* Pausanias, indeed, says that the entrance to the Parthenon, ἐν τοῖς αετοῖς, the sculptures of the pediment related to the birth of Minerva, and that those of the opposite side, Ὀπισθε, to her contest with Neptune. But the difficulty still remains—at which front did Pausanias enter ?—Leake's Atheniensia, pp. 233-254; Wilkins' Topography of Athens, p. 68.

western vestibule; but from the drawings of Carrey, the designs of Stuart, and the originals, now in the British Museum, a pretty correct idea may be formed of its subject and its general arrangement. The procession, in two parallel lines, is represented advancing from west to east, both on the north and south sides of the Temple, so that by turning round the angles of the eastern front, they approach each other in the centre. Towards the centre of the front, are twelve figures seated, supposed to be deities, from their superior size—one half facing the north, the other the south, for the purpose of receiving the heads of the respective columns. These two divisions of sitting figures are separated by five standing figures, which occupy the centre of the frize. Visconti supposes them the Anhephoni delivering the baskets of unknown contents to the priestess of Minerva. The next figure, he thinks, is the Archon or βασιλευς, king of the sacred rites, who receives the peplus or sacred awning. With respect to the twelve seated figures, there seems great difficulty in ascertaining what deities they are intended to represent. In front of the six deities facing the south, are six figures supposed to be magistrates, one of them leaning on his staff. At the head of this column are young women bearing trumpets, vases, and pateræ. Then follows a magistrate, turning round to the sacrificial procession of oxen, some of which are proceeding quietly, others struggling to get loose from the men who are conducting them. Next appear four women, bearing square instruments, followed by a crowd of people of different ages, the procession being closed by numerous cars and horses.

In front of the six deities facing the north are seven magistrates, four of whom are leaning on staffs. The seventh turns towards the procession, and appears giving directions to the two young women heading the other column, between whom and the next file is another magistrate similarly em-

ployed. Then follow females singly, some bearing vases, others candelabra and pateræ. On the north side commences a similar procession of victims, followed by mætici bearing trays of bread and other offerings, men carrying skins of wine, and playing on the flute and lyre, then a crowd of people of all ages on foot, closed, like the others, by cars and horsemen. On the western frize, the figures face the north, being a continuation of the northern column of procession. It consists of dismounted horsemen, accompanied by a magistrate, some fitting their buskins, others their bridles, some in the act of mounting and restraining their horses. The figures on this frize are more detached from each other than on the eastern frize.

The metopes of the frize, amounting in all to ninety-two, namely, fourteen on each front, and thirty-two on either flank of the Temple, were decorated with sculpture in alto-relievo, of such prominent relief that some parts are entirely detached from the back-ground. Fifteen of the metopes of the south side are among the Elgin marbles in the British Museum, and one in the Louvre at Paris. As each of them includes a centaur, it was conjectured that the combat between the Lapethæ and centaurs (centauromachiæ) formed the subject of all the metopes. Stuart was the means of confirming this error by representing centaurs on *his west front restored,* while he might have known that such did not exist. Indeed, of the metopes now remaining on the ruined building, it would appear that out of thirty-six, more or less decipherable, on the east, north, and west sides, no centaur can be detected. They did not even occupy the whole of the south side, for nine of the metopes, according to Carrey's drawings, do not include a centaur; and of the remaining twenty-three, five do not represent a combat, but a centaur carrying off a woman. The combats of the centaurs, therefore, only furnished a sub-

ject for sixteen out of ninety-two. After comparing the drawings of the metopes by Carrey with those by Mr Cockerell, and the artists employed by Lord Elgin, Colonel Leake is of opinion that the east front represented the actions of Minerva herself and the principal Athenian heroes, somewhat in the style of Athenian vases; the north side, the war of the Amazons; the south, chiefly the fabulous contest with the centaurs; and the west front, the warlike exploits of the Athenians.*

Within the cella at the extremity opposite to the eastern portal, and shaded by the purple peplus, stood the far-famed chryselephantine statue of Minerva, of ivory and gold, the *chef-d'œuvre* of Phidias.† According to Pliny, it was twenty-four cubits in height. 'The gold alone,' Thucydides says, 'weighed forty talents,' equivalent to £120,000. Including the height of the pedestal, the statue must have reached near the ceiling. Her position was erect, her robes reaching to her feet; her head was covered with a helmet; her breast with a Medusa's head in ivory. She wielded in one hand a victory, in the other a spear, beside which was a serpent. The helmet was crowned with a sphinx, and adorned with griffins in relief. At her feet lay a shield; on the pedestal was represented, in relief, the birth of Pandora.

The peplus was richly embroidered with the battles of the gods and giants. Dodwell thinks it was used both as a curtain and garment as occasion required. Colonel Leake supposes it to have been an awning or curtain rather than a veil, for the double purpose of protecting the statue from the dew and moisture proceeding from the open part of the hypæthrum, and heightening the mystic sanctity of the goddess,

* For a more particular description of these marbles, see Stuart's Athens, Visconti's Memoirs on the Sculptures of the Parthenon, Wilkins' Topography of Athens, Laurence on the Elgin Marbles.

† The only rival to the Minerva was the Jupiter of Phidias at Olympia.

by interposing a barrier between her and the popular gaze. Mr Wordsworth, on the other hand, alleges that the peplus was not a veil, παραπετασμα, or curtain suspended before the statute in the Temple, but the drapery by which it was invested. He likewise maintains that it was to the Minerva Polias, which was composed of olive wood, and not to the Minerva of the Parthenon, that the Panathenaic Peplos, the embroidered fasti of Athenian glory, was periodically dedicated.

The Temple, including the colonnade, was richly decorated with statues in bronze and painting. In short, the Athenian Parthenon, whether we consider its chaste and exquisite architecture—the grandeur of its dimensions—the beauty and richness of its materials—the excellence and splendour of its sculpture and pictorial decorations—was the most perfect and highly adorned structure of antiquity—the glory of Athens, and the triumph of the three sister arts.*

To the north of the Parthenon stood the two beautiful Temples of Minerva Polias and Erechtheus and Pandrosus. The order was Ionic; but the roof of the southern portico was supported by six caryatides, or statues of women with long drapery, standing upon a low wall or podium, four in front and two in the flanks. The only access to the precipitous rock of the Acropolis was by the west, through the magnificent gateway or vestibule of the Propylea,—a structure contemporary with the Parthenon, and rivalling it in the fine taste and felicity of its execution. 'Here,' observes Wordsworth, 'above all places at Athens, the mind of the 'traveller enjoys an exquisite pleasure. It seems as if this 'portal had been spared in order that our imagination might

* The Temples of Ephesus, Miletus, Agrigentum, Selinus, and Jupiter Olympius at Athens, though of larger dimensions, were less perfect in their taste, execution, materials, and decorations. Moreover, those of Agrigentum and Selinus were never finished, and had no sculptural decorations.

'send through a triumphal arch the glories of Athenian 'antiquity in visible array. In our visions of that spectacle, 'we would unrol the long Panathenaic frize of Phidias, 'representing that spectacle from its place on the marble 'walls of the cella of the Parthenon, in order that, endued 'with ideal life, it might move through this splendid avenue 'as its originals did of old.' *

All these matchless structures were placed on different levels of the Cecropian Rock. The Parthenon, the most conspicuous, crowned the summit, its pavement being on a level with the capitals of the columns of the Propylea. To specify the numerous statues that adorned the Acropolis, would be beyond the limits of this essay. It will be sufficient to enumerate a few of those recorded by Pausanias as existing at the period of his visit:—The statue of Jupiter Polias; the Gigantomachia, the subject of which was the battle of the giants and gods; the brazen colossus of Minerva, by Phidias, commonly called the Minerva Promachus, dedicated from the tenth of the spoils of Marathon, which, including the pedestal, is supposed to have been 70 feet in height; the brazen Quadrigæ, dedicated from the tenth of the spoils of the battle of Chalcis; Ilierum, or Sanctuary of Venus Leæna, which contained the brazen lioness and statue of Venus, by Calamis; Minerva flaying the Marsyas; Theseus overcoming the Minotaur; Phrixus sacrificing the ram; Hercules slaying the serpents; Minerva rising from the hand of Jupiter; the Bull dedicated to the Areopagus; the contest of Neptune and Minerva; the Jupiter by Leschares, and the Jupiter Policus; the Apollo Parnopius by Phidias; the Anachreon; the statues of Io and Callisto, by Demomenes; the Olympodorus; the Diana Lencophryne; the ancient statue of Minerva, by Eudæus; the colossal

* Wordsworth's Athens.

composition of Erechtheus and Eumolpus; Cyenus fighting with Hercules; Theseus finding the slippers and sandals under the rock, &c. Such was the Cecropian Acropolis,—one vast composition of architecture and sculpture.

With reference to the architecture of the Parthenon, it was well known that the vertical lines of the building have a slight inclination outwards, which is even apparent to the eye of an ordinary observer. But it has only lately been discovered by M. Metzen, a Bavarian architect, after a series of observations made on every part of the structure, that, with the exception of the gable lines of the pediments, there is not a straight line of any length in the structure, the horizontal lines of the architrave, and parallel portions of the entablature, frize, and cornice, together with the basement, or platform on which the columns stand, being all arched or curved upwards, though so slightly as not to be perceptible unless on very accurate inspection. In a letter from Athens, read by Mr William Hamilton to the Royal Society of Literature on the 13th of March 1840, it is stated that the same peculiarity is also observable in the Temple of Theseus. Mr Mure of Caldwell, remarking on this discovery, is of opinion that this apparent anomaly had not for its object any optical effect as regards elegance, but simply to augment the solidity of the building, and to secure it, by a certain degree of concentric pressure, against the concussion of earthquakes. But whatever opinion may be formed on this subjeet, it proves that the principle of the arch was then known to the Greeks.

## PART III.

The site, on the summit of the Acropolis, must have greatly enhanced the beauty of the Parthenon. All structures depend much on situation for effect, more especially the Grecian Doric Temple, from its unity and simplicity of composition. The Greeks generally chose elevated and commanding sites, not unfrequently rural, and far removed from the bustle of cities. In illustration of which, besides the temples of the Acropolis, the following examples, among many others, may be enumerated:—the Temple of Minerva, on the promontory of Sunium; of Jupiter, on Mount Panhellenius, in Egina; of Apollo, on Mount Cotylus, amidst the forests of Arcadia; the temples on the rocky heights of Delphi and Eleusis; the Temple of Esculapius, near Ligurio, situated in a grove surrounded by mountains; the Doric temple on the precipitous rocks of Segesta; the temple of Venus, on Mount Eryx; besides those of Juno, Lucina, Concord, Hercules, and Jupiter Olympius, on the lofty ridge of Agrigentum.

The Calton Hill, bearing so striking a resemblance to the Acropolis of Athens, would be admirably suited to the display of the majestic beauties of a restoration of the Parthenon. Inexhaustible quarries of the most beautiful and durable freestone in the vicinity offer materials for its construction equal in appearance to the finest marble. The architects and operative masons of Edinburgh are inferior to none in Great Britain, and have already proved themselves capable of executing the most delicate and difficult members of Grecian architecture. In erecting a great national structure, it is of the utmost consequence to fix on some

model of known and approved excellence, which will admit of being executed on its full scale, and in all its grandeur. Had a composition with a dome been adopted, it must, however handsome, have presented but a paltry and diminutive imitation of St Peter's at Rome, St Paul's of London, or, perhaps, a caricature of the Pantheon. In the Ionic and Corinthian, we could never hope to equal the new Louvre of Paris, or the splendid structures of Italy, and other countries of Europe. The unapproachable beauty and delicacy of our Gothic Cathedrals, waiving all considerations of their cost, would have rendered any attempts in that style utterly hopeless. In selecting the Parthenon as our model, no such risk is incurred. The chaste, majestic, and faultless beauty of the Grecian Doric temple will eclipse the most costly and magnificent works of modern times. Provided the restoration be correctly executed, and accompanied with appropriate sculpture and pictorial decorations, a certain and glorious success must be achieved, the influence of which on the future efforts of national taste and genius in the three sister arts, it is impossible fully to appreciate.

The Walhalla of Ratisbon (Regensburg), the national monument of Germany, begun about 1830, and completed and inaugurated in 1842, is a Grecian octostyle Doric temple, with seventeen columns in the flanks, in imitation of the Parthenon. The whole is constructed of a hard limestone or marble from the mountains of Salzburg. When I visited it in 1839, the external architecture was finished, and the sculpture, by Rauch and Schwanthaler, were placed on the pediments, but boarded over. The interior was only bare walls. From the description, however, by the overseer of the intended plans, as well as the engraving in the Art Union Journal for May 1844, the interior, it would appear, is one great hall, with an entrance at each front, exclusively destined for the

reception of statues and busts of the great men of Germany, after death. There is a gallery supported by columns over each entrance in the great hall, on which are placed caryatides supporting the ceiling. There are likewise narrow galleries on the sides, connecting with those over the entrances, with a projection in the centre of each, having two caryatides supporting the ceiling. I saw two of the caryatides nearly finished in a shed where the sculptors were at work. They were of white marble, but the overseer told me they were to be stained, and partly gilt, in imitation of the ancient statues of ivory and gold. There is to be no pictorial decoration. The building is fire-proof, without a particle of wood in its construction, the roof being of iron and bronze, and the portals of bronze, or some less costly metal, adorned with sculpture. Under the structure are extensive substructions, in which are placed the statues or busts of eminent men living, which, after death, are transferred by a species of Apotheosis to the upper temple. The Walhalla is placed on the brink of a hill close to the Danube, the principal approach being by a double flight of massive stairs and terraces up the steep ascent from the river. The effect of this confused mass of white marble, as I saw it from the opposite plain of the Danube, was most unseemly, and destroyed the beauty and unity of the temple from the very point of view which would have been the most striking and interesting. The Scottish National Monument was projected and begun more than eight years before the Walhalla. Whether the King of Bavaria ever heard of the intended Scottish restoration, is doubtful; but whether he did or not, is of little consequence. Scotland is at all events entitled to the credit of having anticipated the plans of a prince universally acknowledged to be a man of the most refined taste, in all that regards art, in Europe.

English architects, and writers on architecture, are not backward in eulogising the perfection of Grecian architecture in the abstract, but both, with few exceptions, evince the most decided aversion to its being restored in its purity and true dimensions. No sooner was it announced that the Scottish National Monument was to be in its external architecture a restoration of the Parthenon, than all these gentlemen raised a simultaneous outcry against such an attempt as preposterous, and too absurd to be listened to. The Quarterly Reviewers signalised themselves as their champions in a long and elaborate article in No. LIV. An able answer was made in the Edinburgh Review, No. LXXV, but not quite so full as the subject demanded. The following passage from the Quarterly Review affords a fair specimen of their mode of reasoning.

'When employed by its authors and inventors, the architecture of 'Athens is faultless. The separate members of the building have a 'definite relation to the whole. They are aggregated by affinity, and 'connected by apposition. Each one is in its proper place; no one is 'extraneous or superfluous; all are characterised by fitness and pro-'priety. Grecian Architecture is a composition of columns, which are 'intended to assemble themselves into the form of a Grecian temple. 'They seek to enter into no other combination. Beauty and elegance 'result from their union. The long unvaried horizontal line of entabla-'ture rests in stable tranquillity upon the even ranging columns below, 'and the conical shafts are repeated in unbroken symmetry. The 'edifice is perfect in itself, therefore it admits of no change in its plan, 'of no addition to its elevation. It must stand in virgin magnificence, 'unmated and alone. The Grecian temple may be compared to 'a single crystal, and to the process of crystallization. Disturb the 'arrangement of the molecules of the crystal, and they will set into a 'mis-shapen fragment. Increase the number of their crystals, allow 'them to fix themselves upon each other, and their individual regula-'rity will be lost in the amorphous mass. Thus in the Grecian temple 'the component parts have settled themselves into a shape of perfect 'harmony, such as is required by their integral figure; but it is a

'shape that cannot be varied in its outline, nor can it be changed in 'its proportions. Neither does it submit to be annexed to any other. '*Every attempt that is made to blend the temple with any other design* '*produces a lame and discordant effect.* We must reject the arch, the 'noblest invention of architectural science. Porticoes cannot be dupli-'cated. Doric columns cannot be raised in stories. No windows can 'open to the cella. No wing can be added to the right or to the left, 'which does not at once convince the observer that it has no real 'relationship to the centre which it obscures. No adaptation can be 'given which will reconcile it to utility. Plate-glass windows glaring 'through the intercolumniation; chimneys and chimney-pots arranged 'above the pediment, are just as appropriate as English nouns and 'verbs in a Greek hexameter.'

All this is a mere tissue of truisms totally inapplicable to the subject in discussion; for on the assumption that the architecture of the Scottish National Monument is externally to be a classic restoration or *fac simile* of the Parthenon, all their truisms and poetic imagery fall to the ground. Indeed one would naturally suppose that it was intended as a *satire on their own Anglo-Greek buildings,* which are characterized by the very faults, discordant combinations, and corruptions alluded to in the above passage. Grecian Architecture, according to the reviewers, is a composition of columns, which assemble themselves into the form of a Grecian temple, *and seek to enter into no other combination.* Were temples the only structures raised by the Greeks? Vitruvius describes various other combinations of columns: the forum, with its numerous porticos, colonnades, basilicæ, curiæ; the gymnasium or palæstra, with its xysta, extensive peristyles, halls, exhedræ, baths, &c.; the theatres, including their porticos and hypæthral walks. Even the Grecian temple itself assumes a great variety of form, proceeding not only from the different orders and degrees of intercolumniation, but from the several distinct species of temple, differing materially from each other in size,

form, arrangement, richness of decoration, and disposition of the interior—from the simple temple in Antis, to the prostyle, amphiprostyle, peripteral, pseudoperipteral, dipteral, hypæthral, monopteral, circular—not to mention the extensive periboli which generally encircled the larger temples, embracing porticos, galleries, statues, &c. In short, Grecian Architecture included all the graceful variety of which columnar Architecture was susceptible. Besides, are we to reject Grecian architecture, acknowledged by the reviewers to be so 'faultless,' 'perfect,' 'beautiful,' and 'harmonious,' because the arch cannot be introduced—porticos cannot be duplicated—columns cannot be raised into stories—nor wings added;—in short, because we cannot succeed in vitiating and corrupting it according to our own wayward fancies? Had the reviewers been consistent, they would have regarded the steeple or tower equally incompatible with Grecian Architecture as the introduction of the arch, duplication of stories, or chimneys or chimney-pots surmounting the pediments. But, so far from this, we find, in a subsequent page, the following passage:—'There is considerable difficulty in combining a steeple with the Grecian and Roman Architecture. Wren mastered the difficulty, and produced combinations scarcely inferior to the Gothic.' This is disturbing with a vengeance 'the primitive molecules of the crystal,' if not making a barbarous and unwarrantable attack on 'its virgin magnificence, unmated and alone.'

The reviewers maintain that 'the restoration of the Parthenon will teach nothing to the architectural student which he cannot learn from the accurate drawings with which he is presented by his contemporaries.' But, admitting this proposition to a certain extent, of what avail is such a knowledge if it is never to be reduced to practice, but reserved for the libraries and portfolios of amateurs and professional

men? Would it not equally apply to the Gothic, Italian, and other styles?

Mr Elmes, the English architect, in his life of Sir Christopher Wren, takes an opportunity of eulogizing the article in the Quarterly Review, and stigmatizing *restoration* 'as 'plagiarism, and downright theft, without even enough of 'that ingenuity to conceal it which, among the Lacede-'monians, procured pardon for a thief.' Sir William Chambers, another eminent English architect, in his Treatise on the Decorative Part of Civil Architecture, indulges in a virulent attack on Stuart's Athens, expressing his decided opinion 'that it should be entirely excluded from the study of the 'architectural student,' since 'Grecian structures, even in the 'time of Pericles and Alexander, do not deserve much no-'tice, either for dimensions, grandeur of style, rich fancy, 'or elegant taste; it follows that a knowledge ought not to 'be collected from them, but some purer and more abundant 'source, which, in whatever relates to art, can be no other 'than the Roman antiquities yet remaining in Italy.' He asserts that '*the famous Parthenon*,' as he calls it in derision, 'is inferior, both in size and beauty of architecture, to St 'Martin's Church.'

After exhausting every possible objection to the restoration of the Parthenon, and any attempt to execute a national decorative sculpture, the reviewers 'beg leave to state dis-'tinctly that their objections are mainly gathered from the 'most competent judges in their behalf. That they have 'hardly ventured to make any remark which has not been 'sanctioned in substance by the sculptors, architects, and 'dilettanti of the southern metropolis.' In short, 'they con-'fidently assert that they are the faithful organs of the 'general sentiment, and that the best informed artists, and 'lovers of art in England, *oppose themselves to the scheme*,

'because they are fairly convinced that it would powerfully 'impede the progress and cultivation of original design.' They claim the Earl of Aberdeen as 'one of their faithful 'organs,' and triumphantly refer to a passage in his work in confirmation of their doctrine. It is to be regretted his Lordship should have expressed any opinion that could afford a colour of support to those whose bad taste, narrow-minded bigotry, and exclusive pretensions, are sufficiently exposed by most of the public works of architecture and sculpture they have executed in the 'southern metropolis' within the last half century—works which totally disqualify them, even admitting that they are the faithful organs of the public sentiment (of which there seems reason to doubt) from being 'the most competent judges of art.' How the restoration of the Parthenon, as the National Monument of Scotland, should powerfully impede the progress and cultivation of original design, or interfere with the adaptation of modified Greek to ordinary buildings, is a paradox too palpable and absurd to require refutation. To be consistent, the Quarterly Reviewers, along with 'the best informed artists and lovers of 'art in England,' ought 'to have opposed themselves' to the construction of the Walhalla of Germany, which, as already remarked, is a Grecian Temple after the Parthenon. If it be difficult, on the plea of ignorance and prejudice, to find an excuse for the perverted taste of two eminent architects like Sir William Chambers and Mr Elmes, what can be alleged in palliation of the paradoxes of the Quarterly Reviews, and their dilettanti friends. Can we really believe those gentlemen were sincere in taking so deep an interest in our National Monument? Were they and their artistic friends not rather actuated on this occasion by a slight ebullition of jealousy, lest the successful completion of the structure and decorations

should eclipse the architectural glories of the southern metropolis, not excepting the Athenian St Pancras, with its double Pandrosium, and the boasted façades of Regent Street.

Though England was the first to bring to light the treasures of Grecian Art by the publication of Stuart's and Revett's works, she has been the last to benefit by them. While France and Germany have raised noble examples of the Grecian Temple on its full scale, and in all its massive grandeur and rich decoration, England has not produced one building entitled to the appellation of Grecian, either in composition, materials, dimension, or decoration. Her Anglo-Greek practice has extended no farther than attaching porticos indiscriminately to every building, whether a church, a theatre, a palace, a club-house, or a jail,—nay, even to shop fronts, railway tunnels, markets, and fish-stalls. Nor can this excite surprise after the doctrines and principles so dogmatically inculcated by her writers and professional men :—' It is an easy ' matter,' says Blackwood, ' for the citizens of London, revel- ' ling in their superior wealth, and in possession of the seat ' of government, to deride the twelve columns, the fragment ' of a mighty undertaking, on the Calton Hill. Those twelve ' columns, formed on the purest and chastest model, are the ' same benefit to the arts and the public taste which the ' poems of Virgil and Homer are to literature ; they will ex- ' ist, if not destroyed by external violence, for thousands of ' years, and will be admired when the meretricious piles of ' London are reduced to heaps of their mother clay. Even ' now, they are the most imposing objects of the kind in ' Britain. They surprise strangers more than any other edi- ' fice of the island ; and if the structure is completed, by the ' munificence of donations and bequests, on the same scale of

'magnificence, it will give to the Scottish Metropolis a dis-
'tinction beyond what any capital of Europe can boast.'*

The following passage is from an able and interesting article, on the same subject, in Blackwood's Magazine, so far back as 1819 :—

'When we earnestly wish to impress upon the public attention, 'therefore, the propriety of selecting the Parthenon as the model for the 'National Monument, we do it, not from any blind partiality for ancient 'art, or from any propensity to undervalue the genius of contemporary 'artists, but from a sober survey of the causes which have led to the 'eminence of art in other states, and by which the celebrity of our own 'literature and poetry has been created. We cannot forget that the 'works of antiquity were restored, and their spirit diffused over Europe, 'before the Jerusalem Delivered or the Paradise Lost were written. It 'is from a wish to obtain similar advantages for the arts in this country 'that *we press so earnestly for the restoration of the most perfect edifice of 'antiquity in the National Monument.* It is just because we have the 'highest opinion of the genius of our own artists that we would wish to 'give them the immense advantage of having the finest monument of 'ancient art continually before their eyes. It is by such habitual contem-'plation, more than by the hurried impression of a transient visit, that the 'spirit of ancient excellence is to be inhaled, and could they obtain, in 'this way, the advantages which the Italian artists have derived from the 'study of the Pantheon and the Colyseum, we have not the slightest 'doubt that the genius of this country would rival the architecture, as 'it has long done the poetry of Italy. Such a measure would be the 'same service to the arts in this country that the restoration of Virgil 'and Cicero were to the poetry and eloquence of Europe. It is not to 'be forgotten that, till such an edifice is erected, the influence of the 'magnificent ruins of Athens is as much lost towards forming the public 'taste in this country, as the Æneid or the Orations of Cicero would have 'been had they still remained undiscovered amidst the rubbish of the 'monastic libraries; and, were it accomplished, we are sanguine enough 'to imagine that the genius of Britain would make the same addition 'to the simplicity of the Grecian original, that the fancy of Tasso or 'Milton did to the poetry of Greece and Rome. But if the present

* Blackwood's Magazine, No. CCL.—Article on British Architecture.

'opportunity be suffered to escape, it is impossible to say when an 'opportunity may again occur of adorning our northern metropolis with 'this matchless edifice, or of transferring to its inhabitants the taste 'which grew up in Athens round the works of Phidias. Centuries 'may revolve before another similar opportunity occurs; and never, 'perhaps, in the future history of this country, will it fall to the lot of 'its inhabitants to erect a building in which public feeling will be so 'deeply and universally interested. . . . . The influence 'which an ornamental edifice exercises upon the public taste, is almost 'beyond the power of estimation. Whether it is good or bad—it 'must stand for centuries, and determine the taste of those who view it 'when the name even of its original author is forgotten. *Of what 'incalculable importance then to choose well the design of an edifice 'from which such important effects upon the national taste must follow.* '. . . . . The genius of Michel Angelo, and Bramante, has 'sought in vain to deviate from the rules which the Athenian edifices 'have established; and at this day men of all descriptions, differing 'from one another in every other subject of human thought, unite in 'admiration of their unequalled beauties, and, forgetting the rivalries 'of nations, meet in the ruins of the Acropolis *to do homage to that 'perfection of design, which for above* 2000 *years has stood unrivalled 'among the works of men.* In suggesting, therefore, the Parthenon as 'the model of the National Monument, we are not presumptuously 'setting up our own opinion above that of our contemporaries infinitely 'better qualified to judge of the subject than ourselves. It is just 'because *we distrust our own opinion,* and are strongly impressed with 'the importance of selecting an unexceptionable model, that we make 'the suggestion; trusting in support of our opinion to the united 'suffrages of *the greatest men whom the world has ever seen, and the con-'curring opinion of twenty centuries on the only subject, perhaps, in 'which perfect unanimity is to be found in the whole history of human 'affairs.*'

But, besides giving a powerful impulse to Architecture and the sister arts of Sculpture and Painting, its completion, by commemorating the great men and warlike achievements of Scotland, will effect another national and most important object,—it will resuscitate and keep alive that patriotic independence and martial spirit for which our countrymen

were so distinguished, when Scotland was an independent kingdom, but which is apt to die away when united to a larger and richer kingdom like England. This subject is so ably treated in one of the Essays lately published by Mr Alison, that I shall make no apology for quoting a few of the passages bearing upon this point.

'It is impossible to contemplate the union of the kingdoms from 'which this country has derived such incalculable benefits in its national 'wealth and domestic industry, without perceiving that, in time at least, 'a corresponding decay may take place in its literary and philosophic 'acquirements. There are few examples in the history of mankind of 'any independent kingdom being incorporated with another of greater 'magnitude without losing, in process of time, the national eminence, 'whether in arts or arms, to which it had arrived. . . Whatever 'can arrest this lamentable progress, and fix down in a permanent 'manner the genius of Scotland to its own shores, confers not only an 'incalculable benefit upon this country, but upon the United Empire, of 'which it forms a part. The erection of the National Monument in 'Edinburgh seems calculated in a remarkable manner to assist this most 'desirable object. To those, indeed, who have not been in the habit of 'attending to the influence of animating recollections upon the develop-'ments of everything that is great and generous in human character, 'it may appear that the effects we anticipate from this building are 'visionary and chimerical. But when a train is ready laid, a spark 'will set it in flames. The Scotch have always been a proud and 'ardent people, and the spirit which animated their forefathers in this 'respect is not yet extinct. Upon a people so disposed, it is difficult 'to estimate the effects which a splendid edifice, filled with memorials 'to the greatest men whom the country could boast, may ultimately 'produce. It will give stability and consistence to the national pride, '—a feeling which, when properly directed, is the surest foundation of 'national eminence. It will perpetuate the remembrance of the brave 'and independent Scottish nation,—a feeling, of all others, the best 'suited to animate the exertions of her remotest descendants. *It 'will teach her inhabitants to look to their own country for the scene of 'their own glory;* and while Ireland laments the absence of a nobility 'insensible to her fame, it will be the boast of this country to have 'erected on her shores a monument worthy of her people's glory, and

'to have disdained to *follow merely the triumphs of that nation whose* '*ancestors they have ere now vanquished in the field, and with whom, after* '*centuries of chequered hostility, they entered into a union on terms of* '*honourable equality.* . . . Nor do we think that such a monument 'could produce effects of less importance upon the military character 'and martial spirit of the Scottish people of future ages. The memory 'of the glorious achievements of our own age, indeed, will never die; 'and the page of history will perpetuate to the higher orders the recol-'lection of the events which have cast so unrivalled a splendour over 'the British nation in the commencement of the nineteenth century. 'But the study of history is confined to few, comparatively speaking, of 'the population of a country; and the knowledge which it imparts can 'never extend universally to the poorer class, from whom the materials 'of an army are to be drawn. It is of incalculable importance, there-'fore, that some means should be taken to preserve alive the martial 'spirit which the recent triumphs have awakened, and to do this in so 'prominent a way as may attract the attention of the most thoughtless, 'and force them on the observation of the most inconsiderate. . . . 'Every people, accordingly, whose achievements are memorable in past 'history, have felt the influence of these national recollections, and re-'ceived them as the most valuable inheritance from their forefathers. 'The statesmen of Athens, when they wished to rouse that fickle people 'to any great or heroic action, reminded them of the national glory of 'their ancestors, and pointed to the Acropolis, crowned with the monu-'ments of their valour, and invoked the shades of those who died at 'Marathon and Platæa to sanctify the cause in which they were engaged. 'The Romans attached a superstitious reverence to the rock of the 'Capitol, loaded its temples with the spoils of the world, and looked 'back with a mixture of veneration and pride to the struggles which 'it had witnessed, and the triumphs which it had won. . . . . 'The erection of national monuments on a scale suited to the greatness 'of the events they are intended to commemorate seems better calculated 'than any other measure to perpetuate the spirit which the events of 'our times have awakened in the country. It will force itself on the 'observation of the most thoughtless, and recall the recollections of 'danger and glory during the slumber of peaceful life. Like the Roman 'Capitol, it will stand at once *the monument of former greatness, and* '*the pledge of future glory.* . . . . . *If the Parthenon of* '*Athens were transferred to Edinburgh, the public taste would be formed* '*on the finest model which exists in the world, and to the perfection of*

'*which, the experience of two thousand years has borne testimony.* The 'taste which sprung up round the work of Phidias might then be trans-'ferred to our northern regions; and the city, whose similarity of site 'has already procured for it the name of the Modern Athens, might hope 'to vie with its immortal predecessor in the fine arts. *It is impossible 'to over-estimate the effect of such a structure on the public taste.*'

The embellishment of the Scottish capital ought to be a matter of national and general interest. Nothing contributes so much to sustain the renown and prosperity of a country, to improve the taste, and elevate the character of its inhabitants, as the possession of great and distinguished monuments of art. The ruins of Athens still attract admiration from all quarters of the world. Modern Rome and the cities of Italy owe their celebrity almost entirely to their works of ancient and modern art. Had it not been for her remains of ancient grandeur, Rome herself would have irrecoverably sunk under her civil wars and accumulated disasters. It were needless to dwell on the advantages of restoring one of the most admired works of antiquity, as a standard of permanent attraction, which would survive the fluctuating fashions of the day, and remain a model of taste to future generations. In the fine arts, more especially architecture and sculpture, the models and great works are confined to certain localities, beyond which their influence is little felt.

But it must not be supposed that those who advocate the restoration of the Parthenon are so bigoted in their admiration of the pure Greek as to think it could be adapted to all kinds of buildings. The very selection of the Parthenon implies the reverse: that they think it is only suitable for those structures of national grandeur which will admit of being executed on their full scale of dimensions, and with all their requisite decorations. To apply the temple on a reduced scale to ordinary buildings is sure to terminate in

failure. That it is, however, very possible to compose a mixed Greek, adapted to a certain description of modern edifices, is exemplified in the Glyptothec of Munich, with its beautiful portico, and the Museum of Berlin, with its noble colonnade of eighteen columns; to which may be added the High School of Edinburgh on the Calton Hill. In none of these buildings is the arch introduced. For the generality of public buildings and street architecture, the Roman and Italian styles are the most appropriate.

The want of a Gallery of Honour or National Monument for monumental statues and busts is beginning to be felt by the sister kingdom. Nor can the English people shut their eyes to the incongruous anomaly, *if not desecration*, of transforming their two great metropolitan churches of St Paul's and Westminster Abbey into depositories of purely secular monuments of statesmen, warriors, philosophers, poets, artists, &c., huddled together without order, consistency, or propriety, and utterly destitute of all religious character—of the slightest allusions to the Christian's hope of a future life. Any stranger who should for the first time visit St Paul's Cathedral, after observing the numerous statues and medallions, with the figures of Mars and Victory, of Neptune and Fame, with all their attendant lions, tigers, cannons, flags, and blood-stained standards, might well be excused if he supposed himself in a Pantheon of military honour, or temple dedicated to Mars. No country can boast a greater number of distinguished and illustrious men than Great Britain, but no country has done so little to honour their name or perpetuate their fame. 'Why,' exclaims Mr Edwards, 'are the testimonials of national 'gratitude delayed till their object is insensible to the glory 'they confer?'*

* Edwards Administrative Economy of the Fine Arts of England.

Some malicious persons there are belonging to a class opposed to every thing national and patriotic, who have presumed to assert that the National Monument can be regarded in no other light than a monument dedicated to war and the horrors of war. The very reverse is the truth. Like its great prototype on the Acropolis of Athens, its original object was in reality a monument, not merely in commemoration of British and Scottish achievements, including the signal victories of the British arms by sea and land in the last war, *but in celebration of peace, prosperity, and independence,* the consequences of the glorious and triumphant termination of a long and calamitous war, in which Great Britain fought single handed against banded Europe for the preservation of her laws, her liberties, and her altars.

No dishonour could have attached to Scotland, any more than to England, for not raising a National Monument. But after all her pledges, meetings, and resolutions; after all her pretensions, and prospectuses for so many years, not confined to the British Islands, but circulated over the four quarters of the globe; after having obtained two Acts of Parliament authorizing its erection; after having actually commenced the structure, and expended upon it £15,000; after all this, it is no wonder that strangers, and our neighbours of England, should sneer at it as an emblem of our pride, presumption, and inconstancy. In short, we have raised a monument, not to the glory and honour of our country, *but to its dishonour and reproach,* and that on a site so elevated and conspicuous, as to strike the eye of every stranger who visits our metropolis, whether he enters the city from the south, north, east, or west. All strangers and foreigners of taste, it is true, admire this modern ruin more than any other structure in the city. But no sooner do they learn its history, than they express their wonder and surprise that the people of Scotland,

more especially those of the capital, should be so dead to all sense of national glory and patriotism—so devoid of all taste for the fine arts, as not to complete the monument.

It is earnestly to be hoped, now that the offensive clause has been withdrawn in the amended act, that the nobility and aristocracy of Scotland, including those who had withdrawn their support on account of that clause, as well as the other members of the association, will resume their patronage of this national undertaking. If they still remain indifferent, and withhold their support—there being no hope of any patronage or aid from Government—I would call upon the people of Scotland—upon every Scotsman who has a spark of patriotism in his breast, to rescue his country from this stigma on her character and honour. I would call upon every Scotsman who is a lover of the fine arts, to give his aid in promoting the completion of an edifice which would not only afford a scope and patronage in the elevated branches of the three sister arts beyond what was ever known in Great Britain, but shed a lustre over Scotland and her capital, and, by attracting strangers from all quarters, would materially conduce to their wealth and prosperity.

It is not to be expected that funds can at once be realized, or, even if that were possible, that the building, with all its decorations, could be completed in two or three years. All great national buildings, decorated with painting and sculpture, require a course of years for their completion. All that the directors require would be contributions amounting annually to £2000 or £3000, as much as would enable them to raise two or three columns, with their entablature, in the year. This amount could easily be raised by monthly or yearly subscriptions of small sums, which the subscribers could withdraw when they chose. It was only a few days ago that Mr Linning Woodman, the Secretary to the Royal Association,

received a communication on behalf of a gentleman residing in London, a native of Scotland, who is willing to give a donation of no less than £10,000 to the Association for behoof of the National Monument, provided he is satisfied that the people of Scotland are really interested in its completion, and willing to contribute to it. It is to be hoped our countrymen, more especially the citizens and inhabitants of Edinburgh, will not allow so truly generous and patriotic an offer to be made in vain. I am not permitted at present to give publicity to his name, but it will suffice to say that he is a man of fortune, well known for the liberal donations he has made to many public institutions in Scotland. I trust likewise that the members of the Architectural Institute will extend their patronage to the National Monument, not only from its importance in a national point of view, but as giving a powerful impulse to elevated art, more especially that very art for the improvement of which the Institute has been established.

While the directors urge the public to contribute towards the Monument, they are actuated by no selfish or mercenary motives. They can gain nothing by their shares, which are precluded from coming into the stock market, or being a medium of gambling. Their motives are purely patriotic—to celebrate and commemorate the achievements and glory of their country, and give a scope and impulse to Scottish art.

Before concluding I shall call your attention to one important clause in the act incorporating the Royal Association, which is not generally known to the public, and which has deterred many from becoming members of the association, on the idea that it is *a joint stock company*, by which they might incur serious liabilities and losses. But so far from this being the case, the clause alluded to, and confirmed by

the amended act, provides and declares that no shareholders shall be answerable for more than their respective stock and subscriptions. The clause is on page 6th, and *verbatim* as follows :—

'Provided always, and be it enacted, That nothing herein con-
'tained shall extend to charge or make liable any person or persons,
'body or bodies politic, corporate, or collegiate, who is, are, or shall be
'proprietor or proprietors of the stock of the said Association, or con-
'tributor or contributors thereto, or his, her, or their real or personal
'estate, with any debt or demand whatsoever, due or to become due
'from the said Association, beyond the extent of his, her, or their
'capital stock, or share or shares in the stock of the said Association, or
'subscription or contribution, as the case may be, any law, custom, or
'usage to the contrary thereof, in any wise, notwithstanding.'

What insures the security of the above clause, both Acts are declared to *be public Acts*, and to be judicially noticed as such by all judges, justices, and others.

GEORGE CLEGHORN,
*Vice-Chairman of the National Monument Association.*

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## No. VI.

# ON THE USE OF METALS, ESPECIALLY OF COPPER AND IRON, BY THE ANCIENTS.

BY

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[*Read at the Meeting of the Institute in Edinburgh on 15th January* 1852.]

The way in which metallurgy, or the art of working metals, first became known to mankind is involved in obscurity. It is more than probable that the processes of manufacturing the softer metals, as the ore of lead, led the way to the fusion and manufacture of the harder. Lead was much used in early times; in the era of the Roman Empire it was so much in use, that even the cities were supplied with water by leaden pipes. The art of working in gold, silver, copper, and even iron, seems to have been known at a very early period of human history.

Iron may have been accidentally discovered, it has been

supposed, by the fusion of the ore in the making of charcoal, or by specimens of pure iron ore having been fashioned by fire into purposes of utility, for meatoric iron exists in a malleable state. Rude smelting furnaces have been found even amongst tribes—as the Africans—among whom civilization has made little progress.

Copper, and the alloys of tin, by which it became hardened, seem to have been very early known to the ancients.

Brass, so frequently mentioned in sacred and profane history, used for coins and other purposes, was synonymous with copper and bronze. The ancients well knew the process of casting bronze statues, and of mixing copper with tin to harden it. Some of the most valuable works of antiquity were made of mixed metal,—as the Colossus of Rhodes, of which no remains now exist, the weight of which has been estimated at 700,000 lbs. of bronze.

Metallurgy, according to historians, had made great advancement 700 years before Christ. During the reign of Alexander the Great, 356 B.C., the celebrated sculptor Lysippus, originally a worker in brass, laboured so assiduously in moulding and melting metals and multiplying casts, as to have left, it is said, 1500 groups of statuary, which Pliny the elder called the mob of Alexander. Amongst the best of his works were his statues of that monarch.

It has been recorded by the Roman Consul and historian Mucianus, who was the Premier of Vespasian, and who, as mentioned by his contemporary Pliny, in Hist. Nat., b. 39, c. 17, had been thrice consul, in A.D. 52, 70, and 75, that there existed in his time 3000 bronze statues at Rhodes, and that there were believed to be as many at Athens, Olympia, and Delphi.

That the art of working in iron and steel had made

great progress in early times, it is the purport of this paper to show. It is known that the sword blades made in Damascus, a city of great antiquity, and mentioned in sacred writ as coëval with Babel and Nineveh, have had a far spread reputation for their excellence of quality and workmanship and beautiful wave or water-mark. It is probable that long before the Christian era the Orientals, both in Hindostan and China, had also achieved great perfection in the manufacturing both of steel and iron, and in the inlaying of gold and silver. Of this there is very little doubt, from the specimens which have been preserved to modern times. The excellent sword blades of Toledo were early famed, the manufacture of which was introduced by the Moors into Spain, but is now nearly extinct. Although the ancients may not have acquired the same degree of skill in casting metals for general purposes in the mechanical arts as the moderns, they had attained great excellence in the working of malleable iron, copper, and bronze.

The importance of metals in coinage,* and especially the advantages of using iron for weapons of warfare, and in the construction of agricultural implements and various utensils, must have stimulated the faculties of the early tribes of mankind to their improvement. But the many useful properties which iron possessed could not have been at once discovered, and the knowledge of iron-making, and the application of iron to purposes of utility, must have been acquired by slow degrees. Although iron was long known before the Christian era, it has been doubted if it was in general use in the early ages of the world; but it is evident that mankind

* The coins chiefly used by the Jews, Greeks, and Romans, were of silver and brass, and a few of gold. Amongst the Romans the Denarius Victoriatus, Sestertius, and sometimes the Æs, were of silver, and the rest of bronze. The Roman gold coin was the aureus, in value, as stated by Pliny, 24s. 3¾d. The Romans had no coinage, except copper or bronze, till B.C. 269.

understood the art of working both iron and copper before the deluge, from the passage in Genesis, iv. and 22,—'Tubal-'Cain, an instructor of every artificer in brass (נְחֹשֶׁת) and 'iron.' It has been held that copper or bronze is the proper translation of the word rendered brass. The numerous notices of brass in early passages in the Bible must be inferred, in some instances, as meaning copper, and in others bronze.

The same word is used in Hebrew for brass, copper, and bronze. In Latin, the word *æs*, which means brass or bronze, means also copper. In Greek likewise, the word χαλκὸς which means brass or bronze, means also copper.*

In the passage (B.C. 1451), Deut. viii. 9, it is obvious that copper is meant, not brass—'A land whose stones are iron, 'and out of whose hills thou mayest dig brass.'

One early commentator considers that the calamity of the deluge deprived the greater part of mankind of the knowledge of these as well as other arts, and that the use of iron was only revived at a much later period of the world's history. It has been recorded that the Egyptians gave the honour of the discovery of metals to their first sovereign Menes, who, according to Josephus, ascended the throne (2320 B.C.), and who reigned after the fabulous gods.

From sacred writ it is ascertained that metals were common in Egypt and in several countries in Asia.

Egypt, the land of Ham, was distinguished in the very earliest records of the world, not only for the richness of its soil, but for its valuable gold and silver mines, the annual produce of which is early mentioned in Egyptian History, and which were worked by captives taken in

* There appear to have been two kinds of brass known,—one χαλκὸς, copper, or what was termed native brass, also bronze or brass money, or money in general, and the word was applied to a sword, spear, or axe—the other, ὀρείχαλκός (from ὄρος, a mountain), termed mountain brass.

war. These mines have been ascertained by Benomi and Linant to lie in the Bisháree Desert, seventeen days' journey south-eastward of Derow. The gold is found in quartz, and the excavations are 180 feet deep.

Diodorus the Sicilian (Diodorus Siculus) lived 44 B.C.; but as he derived his information, sometimes without sufficient discrimination, from writers who had preceded him, his statements are not always to be relied on. Still there is evidence that he visited many of the countries he describes. He mentions, in the first chapter of his Historical Library, 'that in the confines of Egypt and neighbouring countries of Arabia and Ethiopia there is a place full of rich gold mines, out of which, with much art and pains of many labourers, gold is dug. The soil here naturally is black, but in the body of the earth run many white veins, shining with white marble, and glistening with all sorts of other bright metals, out of which laborious mines those appointed overseers cause the gold to be dug up by the labour of a vast multitude of people. . . . The earth which is hardest and full of gold they soften by putting fire under it, and then work it out with their hands.' . . . After the gold is washed the workmen take it away by weight and measure and then put it into earthen urns, 'and according to the quantity of the gold in every urn, they mix it with some lead, grains of salt, a little tin, and barley bran. Then covering every pot close, and carefully daubing them over with clay, they put them into a furnace, where they abide five days and nights.' After they have stood some days to cool, 'nothing is to be found in the pots but only pure refined gold a little diminished in weight.' The whole description of Diodorus of the manner in which gold is obtained on the borders of Egypt is very interesting. He makes the remark, 'that as gold is got with labour and

'toil, so it is kept with difficulty; creates every where the 'greatest cares; and the use of it is mixed with pleasure and 'sorrow.'

But he gives a very different description of the mines in Arabia, in which is found 'pure gold, called gold without 'fire, for it is not extracted out of little pieces of drossy metal 'by melting in the fire, as in other places, but it is pure and 'refined at the first digging it out of the earth, every piece 'about the bigness of a chesnut, and so bright and glorious 'a colour that this gold adds an exceeding beauty and lustre 'to the most precious stones that are set in it.'

The same author, in his description of Egypt in early times, narrates:—'Near hereunto is represented the king himself, 'curiously carved, and painted in glorious colours, offering 'gold and silver to the gods, as much as he yearly received out 'of the gold and silver mines. The sum was there inscribed '(according to the rate of silver) to amount to thirty-two 'millions of minæ, which has been estimated at three thou-'sand and two hundred times ten thousand of minæ, every 'mina* being £3 : 2 : 6, that is £96,000,000 sterling and 'sixteen thousand millions of crowns.' This may serve to show the resources of Egypt, which possessed valuable mines of copper, lead, iron, emeralds, and sulphur, which are said still to exist in the deserts of the Red Sea.

This description of the abundance of gold and silver amongst early nations is corroborated by many passages in the Bible. In the days of Abraham (B.C. 1918), Gen. xiii. 2, it is said, 'And Abraham was very rich in cattle, in silver, and in 'gold;' also Gen. xxiii. 15,—'Four hundred shekels of silver;' also Gen. xxiv. 22,—'A golden earring of half a shekel, and 'two bracelets of ten shekels weight of gold;' also, at verse 53, —'The servants brought forth jewels of silver and jewels of

* The mina is held to have been equal to the Roman libra or pound weight.

'gold.' One passage shows that the art of casting was early introduced, when Aaron, in the absence of Moses, made the golden calf. Ex. xxxii. 3 and 4,—'And all the people brake 'off the golden earrings which were in their ears, and 'brought them unto Aaron, and he received them at their 'hand, and fashioned it with a graving tool, after he had 'made it a molten calf.' *

It has been supposed that in those ages the working only of a few metals, such as gold, silver, and copper, was understood, and that iron, afterwards so common, was, if then known, little used. From the testimony of ancient authors it appears that long after the deluge, copper was, for many ages, employed for most of those purposes for which iron is now used, such as arms, tools of husbandry, and in the mechanical arts.

In the heathen mythology we find ascribed to Vulcan, the god of artificers, the making of the famous impenetrable armour of Achilles, whose shield is described by Homer†

* In the building of Solomon's Temple gold and silver were much used. See 1 Kings, chap. vi, verse 21, 'Solomon overlaid the house with pure gold.' Verse 22, 'The whole house was overlaid with gold.' Verse 30, 'The floor of 'the house he overlaid with gold within and without.' Also at chap. vii, verse 48, 'Solomon made all the vessels on the altar of gold, and the table of 'gold.' Again in chap. x, verse 14, 'The weight of gold that came to Solo-'mon in one year was 666 talents of gold.' Verse 15, 'Solomon made 200 'targets of beaten gold.' Verse 17, '300 shields of beaten gold.' Verse 21, 'Solomon's drinking vessels were of gold, and all the vessels of the house of 'the forest of Lebanon were of pure gold; and none were of silver; it was 'nothing accounted of in the days of Solomon.' Verse 27, 'The king made 'silver to be in Jerusalem as stones.'

† Iliad, Book xviii. 551.—Pope.

'Then first he formed th' immense and solid shield;
Rich various artifice emblaz'd the field;
Its utmost verge a threefold circle bound,
A silver chain suspends the massy round;
Five ample plates the broad expanse compose,
And god-like labours on the surface rose.'

The whole interesting description shows the great progress that the art of working in metals had then attained; and by referring to line 446, same book, it is seen that the art of melting metal was fully understood—

'In moulds prepared, the glowing ore he pours.'

(B.C. 907.) At the time of the Trojan war iron seems to have been little used, and copper supplied its place both for arms and all kinds of tools and utensils :—

> 'Thus sheath'd in shining brass, in bright array
> The legions march, and Neptune leads the way.'
>
> *Iliad*, book xiv. 443.

> 'The rushing stream his brazen armour dy'd.'—Book v. 136.

> '..... His brazen armour rings.'—v. 604.

> 'Shook with his fall, his brazen armour rung.'—v. 764.

The Romans succeeding, and borrowing many of their customs from the Greeks, no doubt adopted in this respect their practices. It is somewhat singular that almost all the ancient arms and tools now extant are made of copper,—a most convincing proof that the use of copper preceded that of iron, and that the ancients used brass in most of their religious ceremonies. This appears to have been a practice common not to the Greeks or Romans alone, but to all the nations of antiquity. According to Diodorus, the arms of the Egyptians* were commonly made of brass.

xi. 545, its application is shewn—

> 'Thro' the strong brass the ringing jav'lin throws.'

Lit. Trans., book v. 280—

> 'But the brazen spear flying through entirely approached the corslet.'

xi. 45—

> 'Ten rows of brass its ample brim surround.'

v. 180—

> 'Æneas, Prince of the brazen-mailed Trojans.'

Lit. Trans., book vii. 206—

'And Ajax was arming himself in shining brass, a moveable shield of seven hides of very fat 'bulls, and covered with brass, the eighth integument.'

vii. 270—

> '—— Of solid brass the last,
> (The work of Tychius, who in Hylé dwell'd,
> And in all sorts of armoury excell'd.')

x. 35—

> 'A brazen helmet glittered on his head.'

* From the collection of Mr Salt, which has been preserved in the British Museum, several bronze weapons of warfare attest this fact. A portion of a blade of a battle-axe is in this collection 13½ inches long, and 2½ inches broad, inserted into a silver tube, fixed with nails of the same metal. The coat of armour

Herodotus mentions that the Massagetae had their axes, pikes, quivers, hatchets, and horse trappings of brass.

In the following passages of sacred writ the word translated brass occurs :—Gen. iv. 22, Ex. xxv. 3, 'Gold, silver, and brass;' xxvi. 11, 'And thou shalt make fifty inches of brass.' Judges, xvi. 21, 'Bound him (Samson) with fetters of brass.' Numbers, xxi. 9, 'Moses made a serpent of brass.' Job, xxviii. 2, 'Brass 'is molten out of the stone.' Job, xl. 18, 'His bones are 'like strong pieces of brass.' 1 Kings, vii. 14, 'A worker 'of brass;' v. 15, 'He cast two pillars of brass;' v. 16, 'He made two chapiters of molten brass;' v. 27, 'He 'made bases of brass;' v. 30, 'Every base had four brazen 'wheels and plates of brass;' v. 45, Vessels of bright brass;' v. 46, 'Cast on the plain of Jordan; v. 47, 'Neither was 'the weight of the brass found out.' 2 Kings, xxv. 13, 'The

or cuirass of the Egyptians has been described as consisting of about 11 horizontal rows of metal plates, secured by bronze pins. An Egyptian sword or dagger, which was excavated in the ruins at Thebes, also corroborates the general use of bronze in early times. 'The blade was bronze, thicker in the 'middle than at the edges, and slightly grooved, and so exquisitely was the metal 'worked, that some of those examined were found to have retained their plia-'bility and spring after a period of several thousand years, and almost resem-'ble steel in elasticity.' Such is the dagger which has been discovered in a Theban tomb. Spear heads, javelin heads, of bronze metal, have also been found and preserved in museums (the Berlin) which correspond to the description of Homer. It is probable that the Egyptians had succeeded so well in hardening bronze, that not only swords, knives, and warlike weapons and armour were made of it, but the tools and chisels which were employed for carving and cutting hard stones, as granite, and also implements of husbandry, were made of it.

In the ruins of Nineveh, (from Jonah, Nineveh, or Nimroud, existed 862 B.C.,) Layard has as yet discovered few metallic remains. The articles found are of copper. The remains of metals found in Egypt, preserved in the British Museum, consist chiefly of articles in bronze and copper, such as vases, statues, agricultural implements, spear heads, swords, daggers, tools, mirrors, knives, &c. In the Lycian collection, the few specimens of metals consist of articles in bronze and lead. In the same Museum the number of bronzes of the Greeks and Romans render it impossible to particularise them, such as vases, statues, candelabras, helmets, swords, spear heads, &c. In the Antiquarian Museum of Edinburgh there are various specimens of Roman articles in bronze found in Britain.

'pillars of brass, and the bases, and the brazen sea, did 'the Chaldeans break in pieces, and carried the brass of them 'to Babylon;' v. 16. 'The two pillars, one sea, and the 'bases which Solomon had made—the brass of all these ves-'sels was without weight;' v. 17, 'And the chapiter was brass.' 1 Chron. xviii. 8, 'From the cities of Hadarezer brought 'David very much brass, wherewith Solomon made the brazen 'sea, and the pillars, and the vessels of brass;' verse 10, 'Ves-'sels of brass.' 1 Chron. xxii. 3, 'Brass in abundance.' 2 Chron. iv. 1, 'He made an altar of brass, twenty cubits the 'length thereof—twenty cubits the breadth thereof, and 'ten cubits the height thereof.' And in the 4th chapter, which chiefly refers to the description of Solomon's Temple, 9th verse, 'He overlaid the doors of them with brass.' 16th verse, Hiram made pots,' &c., 'of bright brass.' 18th verse, 'Thus Solomon made all these vessels in great abun-'dance, for the weight of the brass could not be found out.' 2 Chron. vi. 13, 'A brazen scaffold of five cubits long.' 2 Samuel, viii. 8, 'From Betah and from Berothai, cities of 'Hadadezer, King David took exceeding much brass.' 1040 B. C.—10, 'And Joram brought with him vessels of silver, 'vessels of gold, and vessels of brass.' The art of working in brass is distinctly mentioned in Ex. xxvii. 2, 'Overlay it with 'brass.' The trade of a coppersmith is also mentioned in scripture, Tim. iv. 14. In all these passages it may be inferred that copper or bronze was meant, and not brass as now used.

According to one writer, who has investigated this subject, it appears that in England, Switzerland, Germany, and in northern kingdoms, arms, rings, and other articles of brass or bronze are often found in tombs. In America also arms and tools have been found made of copper. Hatchets of this metal have been found in the ancient tombs of the Peruvians. It is said that in Japan, in modern times, arti-

cles which, in other countries, are commonly made of iron, are made of copper or brass. Indeed, every investigation seems to prove that no metal was so much used in ancient times as copper. It has been supposed that its general use arose from the circumstance that copper was found in great quantities in ancient times, and was easily wrought; and that the ancients, as has been noticed, early found out the means of making it more useful by alloying it with tin, by which it was tempered and rendered so hard as to acquire in some measure the qualities which iron possessed; besides which, its non-liability to rust must have made it valued.

Although the metal, called brass both in sacred and profane history, was probably chiefly copper, there is undoubted evidence that the ancients—at least the Egyptians, Greeks, and Romans—understood the art of making various alloys with copper and tin. Bronze, so well known to the ancients, is merely a compound of copper with tin; and the brass of the ancients, there is little doubt, was an alloy of copper and tin—not copper and zinc. It has been supposed by some that, although the practice of fusing copper into compounds, and zinc itself, were unknown in very ancient periods, yet the practice existed at a later period of forming the brass used for coins and other purposes, by combining the metals, brass being used before zinc was known in its metallic form, and the zinc may have been cemented with sheets of copper by charcoal, the zinc uniting with the copper without being visible. It is much more probable, however, that the compounds of the ancients were chiefly confined to the mixing of copper with gold, silver, and tin, and that zinc was not used, or unknown. It is improbable that the ancients knew the alloy of copper and zinc. Zinc is only found in the form of calomine, which consists

of zinc, carbonic acid, and silica; and of blende, which is composed of zinc and sulphur. Both of these substances require sublimation to extract the metal; whereas by smelting or fusion they would pass away volatilized,—the former of these processes not very likely to be known by the ancients, although they may have been acquainted with that of cementation. The process of sublimation or distillation may have therefore been unknown to the ancients, while the process of smelting ores was familiar to them;—hence they made use of the alloy of tin instead of zinc. The famed Corinthian brass shows clearly that the Greeks and Romans understood well the various alloys of copper. This brass was a mixture of gold, silver, and copper. At the destruction and burning of Corinth, 146 B.C., this metal was said to have been formed in quantities melted by the heat.

This statement was made by the Roman writer J. Florus, and it is mentioned by Pliny, in Hist. Nat., b. 34, c. 3, only to be refuted as an anachronism, because the phrase 'Co-'rinthian brass' must have been familiar to and used by the ancients long before the destruction of Corinth by Mummius. *Æs Corinthium* denotes the alloy generally made use of at Corinth, and corresponds to *æs Deliacum* or *æs Æginaticum*, the bronzes and alloys most used at Delos and Ægina. The Corinthian alloys, according to Pliny, were mixed with the precious metals, and were of different colours. It has been held by some writers that the bronze called Corinthian, and sometimes Syracusan brass, was made of *Stannum*, (Agricola de re Metallica), the admixture of the precious metals with copper and tin, as the ancients gave the name of electrum to the mixture of gold and silver. It is mentioned by Suetonius that the Emperor Vitellus took away all the gold and silver from the temples, and substituted *orichalcum* and *stannum*.—Sue. Vit., vi, p. 192. As the term

*orichalcum* was applied by the Romans to brass of great price, it may be supposed that the metal here used by Vitellus was Corinthian brass. The Romans applied the term *stannum* as well as *cassiteron*, * to tin; but in the sense in which the former word is here used, a mixed metal is implied.

That the Egyptians early knew the mode of compounding metals has been fully proved by the many articles which have been found in Egypt, especially at Thebes. The early history of the Phœnicians or Sidonians has thrown some light upon this subject. This country was in early times a great emporium of trade for the world. The purple of Tyre and glass of Sidon were early famed. The great progress these people had made in metallurgy is shown from their being employed by Solomon to decorate the Temple of Jerusalem under Hiram, King of Tyre.—See 1 Kings v. 18.; 2 Chron. iv. 11; 2 Chron. viii. 18. The advancement they had made in ship-building and navigation in early times would call for the application of metals for that purpose; and metals are mentioned by Diodorus as having been used for the prows of vessels and anchors. Even the plan of sheathing with metals is supposed to be of great antiquity. The same author, in his description of Britain, mentions, that the Phœnicians undertook frequent voyages by sea in the way of traffic as merchants, and found out the coasts beyond the pillars of Hercules, and that, driven by a storm, they arrived at Britain. This island he describes as very populous; and says that tin was dug and obtained there, 'with a great deal of care and labour. They 'dig it out of the earth, then melt and refine the metal, and 'beat it into four-square pieces like a dye. The merchants 'transport the tin they buy into France, to the mouth of the

* *Stannum* may also have been very hard lead or pewter. Diodorus narrates 'that above Lusitania (Portugal) there is much tin metal—that is, in the 'islands lying in the ocean over against Iberia, which are therefore called 'Cassiteriles.'

'river Rhone.' Tin was largely exported by the Phœnicians from Britain into their own country, where it was used as the alloy of copper in the making of bronze. Speaking of the wealth of the Phœnicians, Diodorus remarks, they planted many colonies both in Africa and in the western parts of Europe. The Iberians sunk many large mines, whence they dug an infinite quantity of pure silver. He gives a description of the rich mines of gold as well as of silver and brass in Iberia. He mentions that in many places of Spain, and in other places of the world then known, tin is found. From this abundance of metals known to the ancients long before the Christian era, one can be at no loss to know that they must have well understood the process of mixing copper and tin, and even silver.*

It has been held by some writers that the Romans were acquainted with the art of tinning or silvering copper vessels, but that vessels of tin have never been found, and silvered ones very rarely. The art of tinning plate iron may be considered as a modern invention, while that of tinning copper was an ancient one. In corroboration of this, the vessels found at Herculaneum were chiefly of copper, or stannum, few of which were silvered, and none tinned; it has therefore been supposed that the art of tinning vessels was not practised. The art of soldering must have been known to the Romans, as Pliny mentions that lead cannot be soldered without tin, or tin without lead. In soldering, a mixture of both metals is required, either two parts or one of tin, and three parts or one of lead, respectively. As they do not appear to have been acquainted with the union of zinc and copper, it is unlikely that they used hard solder, which is a compound of these

* The Chinese gong metal is a mixture of 20 parts of tin to 80 of copper. The Chinese early knew the process of bronzing copper vessels. Speculum metal consists of 1 part of tin with 2 parts of copper.

metals, zinc being in excess. Many of the bronzes of antiquity are found to be made of pieces of metal joined together. Several coins which bear a resemblance to brass have been found to be composed of copper and the precious metals. It has been held by some writers that there is no direct proof of the brass of the moderns—the union of copper and zinc, in the proportion of about four parts of copper and one part of zinc —being known to the ancients. Sometimes in the ancient bronzes a little silver has been found; but the proportions are almost uniform of 12 parts of tin to the 100 parts of copper. It has been held by other writers, from a passage in Strabo, xiii, page 619, that the ancients knew the common zinc ore calomine, although, perhaps, from the reasons previously assigned of the simpler application of tin as an alloy by fusion, they used it instead of zinc; at all events, few specimens of the mixture of copper and zinc have been discovered in the works of antiquity. It has been stated that an antique sword was found, which, from the analysis, showed the presence of a small portion of zinc.

Although copper was thus so generally used in very ancient times, it is not to be supposed from what has been stated that iron was not in use. A passage in Is. xlv. 1, shows the usage of both metals: 'I will break in pieces the 'gates of brass, and cut asunder the bars of iron.' That iron was known at an early period there is no reason to doubt, but, as it appears not to have been generally used, it has been considered that its common use is indicative of a more advanced state of civilization than even that of gold and silver, although so much less intrinsically valuable.

Amongst ancient traditions there was one with the Egyptians that Vulcan taught them to forge arms of iron. The Phœnicians had also discovered iron, and the manner of working it. The Cretans, as Diodorus relates, placed the

discovery of iron, and the art of working it, in the most remote period of their history. Iron is frequently noticed in his history of nations. Describing the Spaniards, he says, 'They, the Celtiberians, make swords, warlike weapons, and 'darts in an admirable manner, for they bury plates of iron 'so long under ground till the rust has consumed the weaker 'part, so the rest becomes strong and firm. Of this they 'make their swords and other warlike weapons, and with 'these arms, thus tempered, they so cut through every thing 'in their way, that neither shield, helmet, nor bone can with-'stand them.' Plutarch also mentions this practice of making steel, which, it is said, still exists in Japan,* where the sword blades are famed. Describing the Arabians, Diodorus says, 'While they abound in gold, they are so much wanting in 'iron and brass, that they exchange gold with the merchants 'for the like weight in brass and iron.'

Some authors ascribe the art of working iron to the Cyclops, and some to the Chalybes, described by Aristotle, a very ancient people, who inhabited part of Pontus, in Asia Minor, abounding in iron mines. Clemens Alexandrinus ascribes the art of making iron malleable to the Norches, a nation on the banks of the Danube. These traditions are hypothetical, and need not be investigated.

From the book of Deuteronomy it is plain that the use of iron was well known many generations after the flood (B.C. 1451.) Thus we read—'A land whose stones are iron' (chap. viii. 9), and 'thy shoes shall be iron and brass' (chap. xxxiii. 25.) In these passages the *iron* must mean iron ore. But no direct mention is made of iron tools or weapons until after the departure of the Israelites from Egypt—'And thou

* In Japan a sabre is described which will cut through a nail without injuring the edge, and cut off a man's head or cleave him asunder at one blow. Marvellous are the accounts of oriental weapons. The ancients say that with their swords they could cut through shields and helmets.

'shalt build an altar of stones: thou shalt not lift up any 'iron tool upon them' (Deut. xxvii. 5.) The words of Moses are—'If thou wilt make an altar of stone, thou shalt build 'it of hewn stone, for if thou lift up thy tool upon it thou 'hast polluted it' (Ex. xx. and 25.) The same injunction is stated in Joshua viii. 31. The passages above referred to (Deut. viii. 9, xxxiii. 25) shew that iron was known in Palestine; perhaps the Mosaic prohibitions may have had an influence in the general use of copper instead of iron both in Egypt and in Palestine. The Jews appear to have been well acquainted, however, with two kinds of iron previous to the captivity in Babylon—the barzel iron, בַּרְזֶל, noticed in Gen. iv. and 22, which was in common use, and the northern iron and steel. The latter is mentioned in Jer. xv. and 12—'Shall iron break the northern iron and 'the steel.' The difficulty which has been urged of the ancients knowing the practice of smelting the iron ore, and making it malleable, seems to have been early overcome. As it is rarely found in a perfect form ready for use, its application to the arts shows the ingenuity of early nations, and their possession of knowledge which we are often inclined to doubt. As early as the days of Moses an iron furnace is mentioned.

It appears from the book of Job, which some commentators suppose to have been written by Moses, that the art of working in iron was known in some countries in the ages referred to. Thus we read, 'iron is taken out of the earth' —(xxviii. 5); 'they were graven with an iron pen'—(xix. 24); 'he shall flee from an iron weapon, and the bow of steel 'shall strike him'—(xx. 24); 'his bones are like bars of iron' —(xl. 18); 'he esteemeth iron as straw,'—(xli. 27.)

Iron does not appear to have been made use of in the Tabernacle (B.C. 1490), and very little notice is taken of

it in the construction of the Temple of Solomon five centuries later (B.C. 1012). That it was abundant, however, in the time of Solomon, and even used in the Temple, there is ample evidence, although copper is the metal chiefly referred to. In the First Book of Chronicles (xxii. 3), it is mentioned that, when David was preparing for the construction of the Temple (B.C. 1017), he 'prepared iron in abundance for the 'nails for the doors of the gates, and for the joinings,' &c., and that he prepared 'brass and iron without weight, (for it 'is in abundance.')—v. 14. In the account of the miracle performed by Elisha, we read that 'iron did swim.'—2 Kings, vi. 6.

Although these passages show that iron (B.C. 1490) was known and used, they only serve to prove that iron, though known, was not in common use, that copper was long in general use before it, and that implements of all kinds,—arms, statues, and vases—were made of copper and its alloys of tin, as bronze, long before iron became worked for general use.

It appears, however, from the way iron is spoken of, that that metal must have been in use in Egypt long before the time of Moses. Its great hardness is alluded to in the words 'I will make your heaven as iron, and your earth as brass.'—(Lev. xxvi. 19). In Deuteronomy, as has already been observed, we find this metal mentioned—'A land whose stones 'are iron, and out of whose hills thou mayest dig brass.' —(viii. 9)—a passage from which may be clearly inferred the knowledge which in those days existed of the use of the ores both of iron and copper. We also read that 'the bed-'stead of Og, the King of Bashan, was of iron.'—(Deut. iii. 2). Mention is also made of an iron furnace (Deut. iv. 20), and of swords, knives, axes, and tools made of iron.—(Numb. xxxvi. 16; Deut. xix. 5; xxvii. 5). The art of working in

iron is distinctly shown in Isaiah—' working it (*i. e.* the molten graven image) with the strength of his arm.'—(xliv. 12). See also Isaiah liv. 16.

To these quotations from sacred writ might be added, if necessary, those from profane writers. According to the Arundelian marbles,* it has been held, iron was known 1370 years B.C.; but Hesiod, Plutarch, and others, limit its discovery to a much later period. Homer distinctly mentions its use —23d Book. By the word 'sideros,' from a simile used in the Odyssey, derived from the quenching of metal in water, it may be supposed iron is meant. In the Homeric poems, and oldest writings, the word χαλκὸς is restricted to copper and its compounds.

> " And as when armourers temper in the ford,
> The keen-edged pole-axe, or the shining sword,
> The red hot metal hisses in the lake,
> Then to the eye-ball hissed the plunging stake."
>
> (*Pope's Ody.*, ix. 391.)

Although both in the Iliad and Odyssey of Homer more frequent reference is made to brass than iron, yet it is quite certain that in his age the use of iron was understood. That it was used, perhaps sparingly, for various purposes, such as swords, javelins, and spear points, may be inferred from the following passages. In the 5th book of Homer, line 722, it is said that ' Hebe speedily applied to the chariot the iron ' axle on each side.' In book vi. 164, Pope's translation,—

> ' With brandished steel from Nyssa's sacred grove.'
>
> ' By the huge knotted iron mace he bore.'—*Book* vii. 160.
>
> ' Each in exchange proportion'd treasures gave,
> ' Some brass or iron, some an ox or slave.'—*Book* vii. 569.
>
> ' The sounding darts in iron tempests flew.'
>
> *Book* iv. 511; also *Iliad*, xx. 111.

* Brought to this country by Thomas, Earl of Arundel, in 1624—hence the name. They contained the chronology of Greece from 1582 B.C. to A.D. 264.

Thus it is ascertained that the discovery of iron was very ancient, and that the art of working it, converting it into steel, and tempering it, was known at a very early period,—probably first in Egypt, Palestine, and other parts of Asia; but it does not appear that its use was either general or much diffused.

Iron in very ancient times must have been regarded of much value, as it was presented in the temples of Greece amongst the most valuable offerings, and rings of iron, which had been worn as ornaments, have been found in the tombs of Egypt, showing the value of the metal. It has been justly supposed that one of the reasons why this metal came so slowly into use amongst the nations of antiquity, and why it was so rare in early times, was the difficulty of smelting it. It was this fact, it has been remarked, which made it to Job such a proof of the wisdom of man, that he had invented the process of making iron, and separating it from the earthy particles in which it is found. It is more than probable that the liability of this metal to decay from its oxidation may be the reason why so few specimens of the iron workmanship of antiquity have been handed down to the moderns in comparison with those of bronze and copper. Although it has been well established that at a later period of ancient history the use of iron became more common to the Greeks and Romans, it is probable that, from the facility with which it could be worked, they preferred to use copper.

In corroboration of the antiquity of the use of iron, a very interesting discovery was made some years ago by the traveller Belzoni, which throws some light upon this point. He found under a statue at Carnac, in Egypt, the blade of an iron sickle, eleven inches in diameter, not unlike a modern reaping hook. It is preserved in the British Museum. It is fractured in three places, and completely oxidized throughout. Traces of the wooden handle into

which it has been fitted are visible upon the end. Belzoni states that this sickle proves that iron was known to the Egyptians before the conquest of Egypt by the Persians under Cambyses, B.C. 525. The name of Darius appears on an inscription on the columns of the Temple of Osiris, and the names of Xerxes and Artaxerxes likewise appear in inscriptions in Egypt. The Persian empire fell by the conquest of Alexander, B.C. 332, and Egypt was reduced to a Roman province under Augustus, B.C. 31. The discovery of this sickle proves beyond doubt not only that iron was early used, but that the practice of reaping with it was of great antiquity. The elder Pliny says little regarding the manner in which the Romans discovered and prepared metals. He however mentions iron in his work :—

'Ferri metalla ubique propemodum reperiuntur, quippe insula etiam 'Italia Ilva gignuntur.'—*Plin. Hist. Nat.* c. 41, b. 34.*

'Metallorum omnium vena ferri largissima est.'—*Plin. Hist. Nat.* c. 43. b. 34.

In Grecian history the well-known fact is recorded, that Lycurgus, who lived B.C. 884, the lawgiver of Sparta and the Lacedemonians, made the use of gold and silver of no value by ordering the Spartan coinage of iron, that there might be no temptation to covetousness, or perhaps its rarity at the period may have led to greater value being put upon it. In the British Museum are preserved several ancient Roman articles made of iron, as the stylus, strigiles, iron fetters, &c.

The Roman writers upon husbandry throw much light by their description of implements upon the progress the manufacture of metals had made about the commencement of the

* The first passage may be thus translated,—'Ores of iron are found 'almost every where, and are also produced in the Island of Ilva (Elba) in 'Italy.' The second passage thus,—'Of all metals the vein or ore of iron is 'found in the greatest quantity.'

Christian era, but there is exceeding difficulty in ascertaining whether iron was chiefly used for their farm implements, or whether many of these were not made of the alloy of copper and tin. It is more than probable, however, from the construction of many of these implements, that they were made of iron. Virgil, who lived B.C. 19, has minutely described the aratrum or plough, of which there were several kinds. Cato mentions two, Romanicum and Campanicum. The first had probably an iron share, and the latter a piece of timber with a share or sock driven upon it. It may be supposed that the plough with which the Israelites fought against the Philistines (1 Sam. xiii. 19) was of metal, probably iron,—'The Israelites went 'down to the Philistines, to sharpen every man his share, 'and his coulter, and his axe, and his mattock.' The Romans had ploughs with coulters and without them—ploughs with shares both broad and narrow pointed, ploughs with or without mould boards, and ploughs with or without wheels. Many other implements used in husbandry, in all probability made of iron, are mentioned by the Roman writers on husbandry, showing the general application and appreciation of metals. The following implements are mentioned beside the plough, —the irpex, crates, rastrum, bidens, capreolus, securis, ligo, pala, sarculum, marra. These were chiefly used, it is supposed, for digging, hoeing, or smoothing the surface of the ground. Beside those there were many others for reaping, beating out, and clearing the corn. The irpex, termed urpix by Cato, was a plank with several harrow teeth, to pull roots out of the earth, drawn by oxen as a carriage. The rastrum was a rake used in manual labour like a common garden rake. The sarculum was a common hand hoe. The bidens was an instrument employed by the ancients in gardens and vineyards; it had two teeth, and was used like a hoe to open up hard or strong ground. The ligo was an instrument like a

common spade. The pala is supposed to be a different name for the same instrument, and seems to have been made of timber, pointed with iron, and was probably used as a shovel. The securis and dolabra were sometimes joined in one,—the securis on the one side, and the dolabra on the other,—and they seem to have been tools like the common axe and adze. The marra is supposed to have been a kind of scraping instrument like a hand hoe. The crates was an improvement upon the irpex; it was in the form of a harrow, and was drawn by oxen, as the irpex. One of the Roman writers on husbandry mentions that the crates* was used for smoothing the surface of the land, and breaking clods, and was drawn by cattle, as the harrow is now used.

Beside these implements, constructed wholly or partially of metal by the Romans, mention is made by their rural writers of the sickle, the scythe, the pecten, &c. In the reaping of grain much attention and care seem to have been manifested by the Romans. One may easily suppose that in barbarous ages, from the want of proper instruments, the practice must have been very rude. The Israelites, to whom manure was an object, cut the straw near the ground and burned the stubble, while the Egyptians plucked off the ears or pulled up the corn by the roots. This is shown by the passage in Exodus, relative to the Israelites, from which it appears to have been the practice of the reapers to cut off the ears of corn with hooks, and to leave the stubble standing,—a practice which the Romans, in some instances, seem to have followed—'So 'the people were scattered abroad to gather stubble instead

* It is probable the harrow noticed in sacred writ, Job xxxix. 10,—'Will 'he harrow the valleys after thee,'—may have been the crates of the Romans. The harrow is thus supposed to have been of great antiquity. It is mentioned by Columella and other writers. Crates was also the name given to all kinds of basket work; there are different varieties noticed by the Roman writers, as *crates pastorales, crates stercorariæ,* woven with straw or rushes.

'of straw.'—(v. 12.) The custom of cutting off the ears was known from early times to the Egyptians, who removed the ears in baskets; in Job (xxiv. 24), it is noticed, 'and 'cut off as the tops of the ears of corn.' The sickle must be an implement of great antiquity, probably suggested by the idea of cutting several ears of corn at once. One commentator mentions that the sickle of Saturn is said to have taught the people to cultivate the earth. It is true that this supposes the working of metals, which, in those very ages, was known to very few nations. Various tribes of mankind might supply this want by different contrivances, but there is no doubt that in eastern countries, from very early ages, the ordinary way of cutting down corn was with hooks or sickles. The sickles used in ancient times were probably very much the same as those now in use. The sickle is mentioned in sacred writ—in Deut. xvi. 9, (B.C. 1451,) 'As thou beginnest 'to put the sickle to the corn;' and in Joel iii. 13, (B.C. 800,) 'Put ye in the sickle, for the harvest is ripe.' These passages corroborate the discovery of Belzoni as to the sickle found in Egypt. The Romans probably made use of the same kind of sickle as the Israelites and Egyptians. Besides cutting down the corn with the sickle they used a scythe, and sometimes they stripped off the ears of corn by means of an instrument called batillum or staff hook, supposed to be a kind of iron saw, and the straw was afterwards cut down. Some commentators think the batillum was like a common scythe, or it may have resembled a pair of hedge-shears. Varro, in one passage, notices the batillum: He states—'They reap after ano-'ther manner in Picenum, where they have a curved wooden 'batillum, upon the end of which there is a little iron 'saw; this, when it embraces a bunch of ears, cuts them, 'and leaves the straw standing in the field. There is an-'other way, as in Umbria, where they cut the straw close

'to the ground with a hook.' This was more probably a scythe.

Columella also mentions different instruments for cutting down grain. 'Many,' says he, 'cut the stalks by the middle 'with vericulates, drag hooks either beaked or toothed. 'Many gather the ears with mergæ, and others with combs, '—Multi falcibus vericulatis, atque iis, vel rostratis, vel den-'ticulatis, medium culmum secant: Multi mergis, alii pec-'tinibus spicam ipsam legunt.'—Col., lib. 2, cap. 21. The merga is supposed to be like the pecten, a comb or a kind of rake, with a short handle, by which the ears were pulled from the stalk. The instrument first mentioned in this passage is called falx vericulata, from falx, a hook, and vericulum, a drag-net. A scythe of this kind may thus be called falx vericulata. This instrument was different from the battillum mentioned by Varro, for the batillum cut off only the ears, while the falx vericulata cut off part of the straw and ear. The antiquity of these different methods of cutting grain with instruments is placed beyond all manner of doubt, and clearly evinces the early application of metals to the purposes of the useful arts. Besides the methods noticed, the Romans likewise made use of machines for reaping and thrashing grain, evincing a still farther developement of the same principles. Pliny (Hist. Nat. lib. xviii. cap. 30), gives an account of a kind of reaping machine used in the extensive plains of Gaul, from which we infer the great antiquity of this machine. Large hollow machines, with teeth fixed on the fore part, are pushed forward on two wheels, through the standing corn, by an ox yoked to the hinder part; the ears cut off fall into the hollow part of the machine. In other places we are informed the stalks are cut in the middle with hooks, and the ears are cut off between two mergites (ripples). There was a difference in the manner of reaping,

according to circumstances. When long straw was wanted, they cut high to keep the straw long; where there was a scarcity of hay, they cut low, that the straw might be added to the palea or chaff, or short straw. The Roman writers, in their description of these modes of beating out corn, notice the use of iron. Varro, describing the Tribulum, says,—'Id fit e tabula lapidibus aut ferro aspe-'rata,' &c.—Lib. 1, cap. 52; that is, 'it is made of a board 'rough with stones or iron.'

From these quotations and descriptions we see the great progress which mechanical inventions had made in ancient times, and the great extent to which iron was used amongst the Romans, especially in the later periods of the Empire.

All the descriptions here given are fully corroborated by the discoveries made in Herculaneum and Pompeii, as also by the remains of Roman antiquities which have been found in Europe. Iron cramps were found which had been used by the Romans in Britain for the fixing of their bricks in constructing their furnaces. Brazen vessels were in common use in the time of Vitruvius. Metal pipes were also in as common use in the time of Seneca. Whether the pipes referred to by the Roman writers (Trans. Arch. Inst. 1850-51, p. 229) were of copper or iron, it is not easy to ascertain. It is more than probable they were made of copper; but the vessel in which they were placed is distinctly described as made of lead, with a brazen bottom to resist the fire, proving beyond a doubt the advancement the Romans had made in the art of working in metals.

The discoveries which have been made in Pompeii demonstrate the truth of the ancient Roman writers regarding the advancement they had made in applying metals to many of the purposes to which we now apply them. Lead

seems to have been in common use as at present for conveying water in pipes, and was applied for distributing water from their aqueducts through their cities—for supplying fountains and jets d'eau. The description given by some of the Roman writers of the use of copper for supporting roofs and lattices of windows also proves that the Romans employed metals in the construction of their buildings.

It might be expected that the discoveries made in the ruins of Herculaneum and Pompeii would have thrown much light upon the use of metals amongst the ancients ; but both these cities, being of the second order, were not likely to indicate the same progress in the arts as the capital. Herculaneum in Campania is supposed to have been founded about 1340, B.C., and was destroyed by the eruption of Vesuvius 79, A.D. It thus partook, during the many centuries of its existence, of the character of the ancient Roman art. The ruins of Herculaneum are about 24 feet deep below the surface, and the ashes and lava which buried it now form a mass of dark grey stone, which is easily broken, and does not adhere, but rather encases the substance within, so that marbles and bronzes have been well preserved. The important relics excavated since its discovery in 1713 are highly interesting, as respects metals, coins, rings, and bronzes, tripods, lamps, looking-glasses of highly polished metal, kitchen utensils, as copper pans lined with silver, kettles, cisterns for heating water, and other articles.

Pompeii was also destroyed by the eruption of Vesuvius 23d August 79 A.D. Its early history is but little known, although supposed of great antiquity. It was about three quarters of a mile in length, and half a mile in breadth. The ruins are about from 12 to 14 feet below the surface. Its excavation commenced in 1755, although its ruins were known to exist in 1689. The ruins are so perfect, that they convey

an accurate idea of the buildings as they existed ; hence they throw a clear light upon the state of the arts of the ancients. The streets are generally very narrow, and the houses low, but some of them are several storeys in height. Others of them are insulated.

In Pompeii fine specimens of metals have been found, showing, beyond the possibility of mistake, the progress which the art of metallurgy had made eighteen centuries ago. Bronze statues have been excavated in high preservation—as a bronze statue of Fame ; many gold, silver, and copper coins ; a great many utensils of all kinds,—as chisels, saws, bells, springs, hinges, buckles, locks, inkstands ; and articles in gold and silver—as ear-rings and spoons. The numerous lamps (1000 found in the baths), a candelabrum, an oval cauldron or boiler, cooking and kitchen utensils, scales, and steelyard, all indicate the progress of civilization and of luxury. Numerous pieces of armour have also been found —as helmets in bronze, and greaves. Lead pipes, as well as other conduits, appear to have been employed for the conveyance and distribution of water ; and iron and copper were then used for many of those purposes for which the moderns now employ them,*—even to the making of shackles, within which human bones were found in the prison.

The frequent use of the arch in Roman Architecture, instead of beams and joists as now practised, and the frequent use of bricks, may serve to explain why metal was not more required in their building and great engineering works, such as the celebrated stone bridge over the Rhone, built in the reign of the Emperor Trajan, consisting of twenty arches, and

* Diodorus corroborates this, for he mentions a bridge where, that the stones might be more firmly 'join'd, they were bound together with hooks 'of iron, and the joints filled up with melted lead.' What more could the moderns do ?

other great works. That timber, however, must have entered largely into the construction of their buildings is shown from the conflagrations of their cities. Cæsar's bridge over the Rhine, constructed when the Romans first invaded Germany, was made of timber; also the Pons Publicius at Rome. *

Although it is not easily ascertained from history to what extent iron was used in the construction of buildings by the Romans, and although, from its perishable nature, it could not be expected that many of its applications would reach these times, yet there is ample evidence, from what has been shown, that its utility was appreciated, and its use common. It has been said that the large stones of the aqueduct bridge at Nimes have been joined together without cement by ligaments of iron.

In domestic buildings iron was used, according to the Roman authors, for many purposes similar to those to which it is now applied, such as the making of nails, bolts, locks, hinges, hooks, pillars, gates. For the last of these probably bronze was more frequently used, as the two gates of the Temple of Janus, which were opened in war and shut in peace, consisted, according to Livy, of brass. The brazen gate of the Pantheon is described to have been of great magnitude, and of fine workmanship. The progress made in the casting of statues in bronze has already been noticed, and when historians have recorded that there were 420 temples at Rome crowded with statues, one may easily conceive that bronze casts would be extensively used. Even brazen columns or pillars were constructed at Rome, as the Columna Ænea. At the Columna Mænia, named

* This bridge is said to have been so framed as to require neither iron bolts nor ties. No one reading the descriptions, however, of the colossal works of antiquity in Egypt and in Rome,—of their bridges, aqueducts, and sewers—of their triumphal arches, forums, basilicas, temples, amphitheatres, and columns,—but must be convinced that in the erection of these the use of metal was common.

after C. Mænius (A. C. 417) were placed the brazen beaks of captured ships.

The great skill displayed by the Romans in the manufacture of their brazen lamps is well known. These have been found in every variety of form and size. Many of those found at Herculaneum are preserved at the museum of Portici. Their braziers also displayed equal taste. In the construction of their carriages metals were employed, as with us, at least to the extent of the wheels, which were surrounded with iron or brass rings. Iron scythes were attached to their war-carriages. In sacred writ the extent that metal was used is shown by the words—'For he had nine hundred chariots of iron,'—that is, armed with iron scythes (Judg. iv. 3; see also i. 19.) Regarding their weapons of warfare, we have the testimony of Diodorus, who lived at the period when the Temple of Janus was shut, when Cæsar had conquered the then known world. He was himself a native of Sicily, had opportunities of knowing the facts, and has stated of the celebrated mathematician Archimedes, also a native of Sicily, who flourished about 250 B.C., that such was his mechanical skill, that by means of ropes and pulleys he drew towards him a galley which lay on the shore manned and loaded, and that by means of grappling-hooks placed at the extremity of levers he hoisted up vessels in the air and dashed them to pieces upon the rocks. His power in setting fire to the Roman ships at the siege of Syracuse with reflecting mirrors was long deemed fabulous, but modern discoveries have made this less doubtful. His knowledge of the power of the lever was great. It has reached posterity as one of his sayings—'Give me where I may 'stand, and I will move the world.' Diodorus mentions that Egypt was indebted to him for the invention of the screw pump, for drawing off water,* and of other useful machines;

* Diodorus remarks—'For this engine is so ingeniously contrived that a

and Vitruvius mentions that he knew the doctrine of specific gravity.

That he was well acquainted with the uses of iron and of other metals, and applied these, there is no doubt, from the fact of the powerful war-engines he contrived. The Roman battering-ram consisted of a beam 100 feet long, suspended by chains, and armed at one end with iron, in the form of a ram's head. Iron was also used in the later periods of the Roman history for many purposes of attack and defence, and for implements of warfare. There can be no doubt that, as their conquests extended throughout Europe, Africa, and Asia, they would participate in the knowledge of the minerals and metallurgy of the countries they conquered.

In machinery there is little evidence that the Romans had made much progress; but it is not to be supposed that Hero of Alexandria (B.C. 120), to whom the invention of the steam-engine has been ascribed, did not well understand and appreciate the use of metals. His work on pneumatics, written in Greek, treated of his own inventions and of those who had preceded him.

In naval warfare the use of metals must likewise have gradually progressed with the ancients. The corvi, or crows, or iron hooks, and ferreæ manus, drags or grappling-irons, were used, and the nails and fastenings of the planks of their vessels were also made of metal.

It has thus been seen to what a variety of purposes the ancients applied metals at a period in history when it is often erroneously supposed the world was in an uncivilized state. One striking fact, proving the abundance of the precious metals, is recorded by Diodorus, who, when describing the Phœnician

'vast quantity of water is, strangely, with little labour, cast up. . . . . .
'The ingenuity of this artist is to be admired, not only in these pumps, but
'justly in many far greater things.'

merchants in early times, says 'that such was their covetous-
'ness, that when they had fully loaded their ships, and had
'much more silver to bring on board, they cut off the lead
'from their anchors, and made use of silver instead of lead.'* The ancient anchors were made of wood filled with lead, but the Romans afterwards used iron and bronze for anchors. Another striking proof of the progress of luxury is recorded by the Roman historians, who tell us that at the battle of Cannæ, in the second Punic war, when Hannibal defeated the Romans, he sent to Carthage three bushels of gold rings, taken from the fingers of the knights.

In a paper of this kind it is hardly possible to give more than a mere condensed view of a subject of such magnitude as that which I have considered; but enough has been said to show the great knowledge which mankind possessed from very early times of the use of metals. The very limited information which has been handed down to posterity of the mines of the ancients, does not serve to throw much light upon the subject. The historian Diodorus has given a few notices regarding these; and from his interesting work a few passages have been given, showing the vast resources of the ancients in gold, silver, and other minerals. With respect to iron, in his description of the Mediterranean Sea, he

* This anecdote by Diodorus refers to early history, and I have given a few extracts from what may be termed the fabulous part of his otherwise valuable record of the times he lived in. His description of Assyria and Babylon, from which many historians have drawn their narratives, is replete with pictures of ancient magnificence, as the works of Semiramis, Jupiter's Temple, and the hanging gardens in Babylon. He describes statues in bronze and apartments in brass in the Temple of Jupiter, with two brazen gates at each end of a vault, and statues of beaten gold. That of Jupiter weighed 40,000 Babylonian talents. The statue of Rhea was of the same weight, sitting on a golden throne, having two great serpents of silver placed at a table of beaten gold, forty feet long and fifteen broad, weighing 500 talents. At the hanging garden, one of the seven wonders of the ancient world, the roof was covered with sheets of lead, showing that the use of lead in these early times was well understood.

mentions an island, Æthalia, distant from Lipira nearly 100 furlongs, which abounds with ironstone, which the natives dug and cut out of the ground to melt, in order to make iron.

Strabo, (B.C. 25), who visited many countries, and upon whose geographical work reliance is placed, mentions the abundance of gold, silver, copper, and iron found at Turdetania, part of Spain.

According to some writers, such as Quintus Curtius, so plentiful was gold and silver, that even the soldiers of Alexander the Great made their armour of it. The Greeks and Athenians had mines, which they wrought, of silver, lead, zinc, copper, but not gold; but the gold mines of Thrace were known to the Phœnicians, who also knew and worked the copper mines at Cyprus. When they conquered Spain, they found immense supplies of gold, silver, and quicksilver. The value of the tin mines in Britain was early known to the ancients—a fact which serves to show that the natives of Britain, when the Phœnicians traded for tin with them, must have been farther advanced in civilization than is supposed. At the Roman invasion of Britain, the minerals must have been an attraction to them to maintain their hold of the country. There is no doubt that the lead mines in Derbyshire were wrought by the Romans, as blocks with Roman inscriptions have been found, and preserved in the British Museum. As zinc has not been met with in a metallic state, although existing in other forms in several lead mines, it is improbable that it was used, as already noticed, though it may have been known to the Romans. It has been fully ascertained that gold mines were worked by the Roman soldiery in North Wales; and also that iron works were established by the Romans in the Forest of Dean, in Gloucestershire. And it is more than probable that coal and other mines

were worked by them in Britain. Various lead, copper, and iron mines situated in Germany, France, Spain, and other countries, there is no reason to doubt, were known to them. The rich iron mine of specular ore at Elba was known and wrought by the Romans in early times, proving beyond question that the art of making iron and its uses were well known. The metals used by the ancients appear to have been gold, silver, copper, tin, iron, lead, cadmia, antimony, and quicksilver.

Even from the imperfect account given in this paper (having been unexpectedly requested by the Secretary to give a paper to the Institute), enough has been said to show the knowledge which the ancients had of minerals, and the great progress they had made in the art of metallurgy. It has been seen that in all ages and in all climes the power of reason has been given by divine intelligence to mankind, and has enabled them to make even the crust of the earth to contribute to human benefit; while, by the gift of industry, the art of metallurgy has given employment to the people, and stimulated ingenuity, and advanced refinement. But when bringing an array of facts before this Institution bearing upon the knowledge of the ancients, we would fail in our object, were there not something more to be deduced from them than what is fitted to gratify curiosity,—if the reflection were not awakened in the mind that all human things are perishable—that even the hardest metals will, like the rocks, decay,—and that the wonderful Providence which rules and governs the world, by whose decree kingdoms rise and fall, has so ordained, for the wisest and best of purposes, though these are inscrutable to us. When we look over the page of history we find nations pass before us in rapid succession. Many of them, 'like the baseless fabric of a vision,' have passed away and left 'not a wrack behind.' And while we thus see

the knowledge, genius, learning, and skill which many of the ancient nations possessed, and which it took centuries in their history to attain, now almost buried in the tomb of oblivion, they will not have lived in vain if we, profiting by what they have left behind, avoid the rocks upon which they were destroyed. Should not a spirit of thankfulness be inspired, that our lot is cast in better times, when opportunities of instruction, open almost to all, spread before us the wide fields of human knowledge.

ERRATA.

Page 122, third line from the top, for meatoric read *meteoric.*

Page 133, last line of foot-note, for Cassiteriles read *Cassiterides.*

Page 134, thirteenth line from the bottom, for stannum read *bronze.*

TRANSACTIONS OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND.
SECOND SESSION, 1851-52.

# No. VII.

# REMARKS ON THE DRAINAGE OF EDINBURGH.

BY

GEORGE SMITH, ESQ., ARCHITECT.

[*Read at the Meeting of the Institute in Edinburgh on 29th January* 1852.]

THE Sanitary agitation which has now been in existence for some years, and is daily gaining additional vigour and activity, has at length forced itself on the attention of the Government and Legislature of the country, while the public authorities of almost every city and town in the empire have been awakened by the movement, which is now looked upon as involving one of the most important social questions of the age.

The results of all the inquiries on the importance of effective drainage and sewerage abundantly demonstrate that a more perfect system than that at present in practice is essential to the general health, particularly to that of populous districts, no fact being more familiar to medical men, than that in many such districts defective drainage is a prolific source of fever and disease.

Architects and engineers, partaking the feeling of medical men on the subject, are now directing more of their attention to the means calculated to remedy this great evil than formerly, and, assuredly, in no other direction could their ingenuity be more usefully and beneficially employed.

Before any extended improvements for a more perfect sewerage of Edinburgh can be expected, a large supply of water is indispensable for scouring out the soil from the street sewers. This is termed '*flushing the sewers,*' and is effected by shutting a sluice, until a sufficient body of water is collected in the upper end of the sewer ; the sluice door is then opened, when the sudden discharge of water carries off the heavy impurities, and prevents their accumulation in the sewers.

If we were provided with an adequate supply of water, another fertile source of disease would be removed, namely, *the area cesspools ;* but before this can be accomplished we must have a more improved form of sewers, so as to admit of the passage of a rapid flow of water ; and to secure this important object, nothing has yet been invented in my opinion better adapted for the purpose than fire-clay pipes, particularly for house drainage. Those that have been in general use for some years past are termed 'the spigot and faucet jointed 'pipe,' which answers every purpose of complete drainage, with this disadvantage, however, that in the event of a portion of a pipe requiring to be taken up for repair, or to have a branch joined to it, the whole line of pipe must be broken, as a single length cannot be unjointed. But this defect has been remedied by Messrs Livingston of Portobello, who have invented a joint with a moveable cover, which they have secured by patent, so that if a single length of their pipe requires to be lifted, it can be done by merely removing the cover of two joints.

During my experience as an Architect in Edinburgh, I have frequently been at a loss to know what streets had sewers and what had not; and when a sewer was known to be under a particular street, the dimensions, the level, and even the position of that sewer were with difficulty ascertained. The great desideratum is the want of a correct plan and section of the different streets of the city, which should show the position, dimensions, and levels of all the existing sewers.

In order to remedy this evil, I would recommend the different public Boards, as well as the private parties who have feued out ground, to take the matter up, and to appoint a qualified surveyor of sewers to prepare a general plan, with sections, showing the whole existing sewerage within the royalty. This can now be very accurately done from the admirable plan of the city published by the Messrs Johnston. Being laid down to a large scale, it will greatly facilitate any detailed system of improved sewerage that may be adopted.*

As complete drainage of land is the proper foundation of agricultural improvement, so complete drainage of streets and houses is the first step to all sanitary improvements in towns. It is my opinion, and I believe there is no doubt of the fact, that several of the street sewers in Edinburgh are so ill constructed as to be nothing better than places of deposit for the solid parts of the soil. They are in general too flat, particularly the sewers in those streets that *run east and west*, and they want water for flushing them. The consequence is, the solid matter, in place of being carried off to the outfall, settles along the bottom, and in a few years these sewers are filled up, as was the case with that in Great King Street three years ago, when it had to be cleaned out, and several hundred tons of solid soil removed.

* The Police Commissioners have at last ordered a Plan of the city to a large scale, showing the existing drains, &c.

For several years before the King Street sewer was cleaned out, it was a source of great discomfort to the occupants of the houses in that quarter; some of the side drains were stopped and rendered useless; others that were clear became ventilating channels for conveying the noxious effluvia from the mass of impurities lodged in the sewer.

It is evident that if there is not a constant flow of water through the sewers they cannot possibly be kept clear of deposit, but must gradually fill up, and become, in fact, neither more nor less than extensive cess-pools, and thus greatly increase the evil they were intended to remedy.

My object in this paper is to bring the state of the sewerage of Edinburgh before the Institute, to point out what has been done within the last quarter of a century, and to state what in my opinion is still wanting to improve and extend the drainage of the city.

The situation of Edinburgh presents singular facilities for carrying out a complete system of sewerage, being within two miles of the sea on the north and east, and the level of the lowest part of the town being about thirty feet above high-water mark.

The map of Edinburgh shows three distinct valleys lying east and west, viz., the Water of Leith, which skirts the New Town along the north boundary; the 'North Loch,' now the Princes Street Gardens, forming the centre valley; the Grassmarket and Cowgate the southern. These three valleys form the natural drainage of Edinburgh.

That in which the Princes Street Gardens are situated was the first of these that was properly drained. Before the gardens were formed, an open ditch ran along the bottom of the valley, into which numerous soil drains discharged themselves. But this ditch became in time such a nuisance that compulsory powers were obtained, about twenty-five years

ago, to raise funds for making a covered sewer, when upwards of £4000 was collected from the city, the proprietors of Princes Street, the Merchant Company as proprietors of the Lothian Road lands, and other parties, who drained into this great trunk sewer.

At its western extremity this sewer has a double branch, one commencing at the Charity Workhouse gate, St Cuthbert's Lane, which is carried east through the old burial ground, and the other commencing at the King's Stables, Grassmarket Road. These two branches were united to the main trunk at the west end of the gardens, east of the churchyard. From that point the main sewer was carried right through the centre of the gardens, having been tunnelled under the Mound, and onwards to the North Back of the Canongate and Abbey Hill, where it discharges itself into an open ditch.

This is the largest and most important trunk sewer in Edinburgh; it receives the water and soil from the whole drains right and left of the valley—from the Lothian Road grounds and Portsburgh on the west, to the Abbey Hill on the east; it then flows in an open ditch for a short space, until it is separated by artificial streamlets through the Meadows for the purpose of irrigation.

The last of the valleys drained was the Cowgate. This important sewer was built by voluntary subscription in the years 1836 and 1837, and cost £2000. It drains the whole streets right and left from the Grassmarket on the west to the South Back of the Canongate on the east; and at a short distance below St John Street is carried to an open ditch on the south side of the road, when it is used for irrigating the low fields in that quarter.

In these meadows an extensive system of irrigation with sewage water is practised; and such is the value of this rich

manure to the proprietors, that while their corn-fields only yield them a rental of from £4 to £5 an acre, the meadows readily give from £20 to £30. Whether this profitable nuisance is the cause of typhus and other fevers in that neighbourhood, I shall not take upon me to say; but we all know that in a hot summer evening the stench from these fields is intolerable.

I shall now draw the attention of the Institute to another great source of pollution, namely, 'the Water of Leith,' the nuisance here being entirely caused by the discharge of the filth from the drains and sewers on the north side of the town into the open bed of that stream, and shall endeavour to point out what, in my opinion, is the remedy for this evil.

The Water of Leith, from St Bernard's to East Warriston, may be said to be a great open ditch for the reception of every kind of filth, which accumulates in stagnant pools, until an occasional flood carries it off to the sea. Thus, besides the injury done to health, a serious loss of valuable manure is sustained. In the summer months almost the whole river water is taken out of the natural bed, and conducted to the flour and meal mills, leaving the channel dry, with exception of the feculent sewage. To remedy this evil, I would suggest that a large sewer be constructed along the south margin of the river, so that all the existing sewers may be discharged into it, in place of allowing them to flow into the bed of the river.* It is in vain to hope that the condition of this beautiful suburb of Edinburgh can ever be materially improved till this portion of the river is protected from pollution, for unless an intercepting sewer be carried along the river side

* The sewers that have their outfall into the Water of Leith are :—Those in the Earl of Moray's grounds; those in St Bernard's grounds; those from Queen Street, Heriot Row, and streets north of the same; and the Inverleith and Warriston districts.

until it meets the high-water mark at the Leith Saw Mills, or, at all events, to Bonnington, the nuisance will not be effectually removed. If the Commissioners for the Crown, then, or other public authorities, have to apply for a bill to substitute covered sewers for the open ditches now in use in the neighbourhood of the Palace, the sewer for the Water of Leith ought to be embraced in the same act.

If the Water of Leith were thus purified, effect could be given to the very judicious plan of the late Robert Stevenson, Esq., to provide for a more constant run of pure water in its channel, by building low weirs or dam-dykes across it at proper distances, which would also form pleasant water-falls when the surplus water rose above their level. At present, the soil from the drains that discharge into the river is lost,—to save it, I would suggest that two or more large tanks be constructed at the termination of the proposed sewer, before discharging in the river at high-water mark. The value of the soil saved for manure I cannot well estimate, but I feel confident it would yield a large annual revenue, and form a fund to repay the cost of the proposed sewer and tanks.

If this improvement were carried forward, that portion of the Water of Leith from St Bernard's to Bonnington, in place of being, as it is at present, an intolerable nuisance, and a source of discomfort to the occupiers of the houses in the district of Stockbridge and Warriston, would become a pure natural stream, pleasant to behold, and be the means, at the sametime, of raising the value of the property in these districts.

In Low Broughton there is also an open ditch, into which the drains of the Broughton Street district are discharged. This ditch is carried through the nursery opposite Mansfield Place, and then spread over the low ground in that neighbourhood, and after the irrigation of these fields it is

carried through the lands of Pilrig. If it were made a covered sewer it could be united with that proposed for the Water of Leith near Redbraes.

At the outfall of these sewers I would recommend the Commissioners of Police to purchase an acre or two of land on the south side of the Water of Leith, and there construct two large soil-tanks, so as to separate the liquid from the solid manure; and if the ashes and street sweepings were carted to that place of deposit, and mixed with the former, it would be rendered much more valuable as a fertilizer for agricultural purposes than the dry ashes hitherto sold by the police.

## Estimate of the Expense of the Water of Leith Sewers and Tanks.

Should the public authorities decline to purify the Water of Leith, it becomes a question whether, looking to the value of the manure, the work could not be executed by a joint stock company.

I have made a probable estimate of the expense of the sewers and tanks to see what return would likely be obtained by embarking in the scheme. Say,

| | | | |
|---|---|---|---|
| 3100 lineal yards of sewer, at £2 ..... | £6200 | 0 | 0 |
| Building manure tanks..... | 1300 | 0 | 0 |
| For two acres of land ..... | 900 | 0 | 0 |
| | £8400 | 0 | 0 |
| Contingencies ..... | 600 | 0 | 0 |
| Value of works and land..... | £9000 | 0 | 0 |

The annual value of the manure saved is not perhaps

so easily calculated. Some agricultural chemists estimate the value for each person in a town at 10s. a year; but as I fear that value has never yet been realized, I will take it at 5s. a year, and this, assuming the population of the northern division of Edinburgh to be 20,000, would give £5000 0 0

| | | | | |
|---|---|---|---|---|
| Deduct the interest of the expenditure, | £450 | | | |
| And the expense of management ..... | 1050 | | | |
| | | 1500 | 0 | 0 |
| Leaving a clear annual profit of..... | | £3500 | 0 | 0 |

In the execution of street sewers, which have to receive not only the water from the surface-channels but the soil-water from every house, the following particulars ought to be attended to:—

1*st.* The sills of the street sewer to be from two to three feet below the foundations of the houses to be drained.

2*d.* Eyes for the house-drains to be formed along the sides of the street sewer at the time it is constructed, at about two feet above the bottom.

3*d.* To prevent rats getting from the sewers to the houses, a close iron grating ought to be fixed at the mouth of every tail-drain.

4*th.* Sewers ought to be constructed in straight or easy curved lines, with a regular descent from the summit-level; for if built in a crooked, tortuous course, the strength of the current is lost, and the solid matter settles along the bottom.

In some of the best streets in the New Town of Edinburgh there are houses with underground storeys sunk below the level of the street sewers, which houses had in consequence

either to remain undrained, or the builders had, at a great expense, to carry a branch drain to a more distant sewer on a lower level.

Each soil-pipe, before entering the drain, ought to be provided with a proper trapped cesspool, to prevent the escape of foul air from the sewer. Of these traps there are various forms. The most simple and easiest to construct is a curved bend in the lead soil-pipe; the bend keeping always full of water, prevents the effluvia getting up the pipe.

We thus see that a complete system of sewerage comprehends both surface and underground drainage of all streets, courts, and houses.

The old public sewers under the Edinburgh streets are built of stone. Some of them are of an oval or egg form; others are square, with hollowed sills. For the main streets, they are of such dimensions as to allow of a passage through them, for cleaning out, or for repair. The house drains have hitherto been built of stone or brick, but now they are generally formed of tubular pipes.

It is a great mistake to build soil drains with common ruble stone; for if such drains are within the house, rats will work their way through the mortar and open joints of the small stone packing; and the consequence will be the pollution of the house with noxious smells. Properly constructed drains must have the sills hewn straight and smooth, and made perfectly close in the joints, and the declivity should be as uniform as possible, to accelerate the current, for if there is the smallest interruption in the sill of the drain, and a deficiency of water, the solid matter will settle, and gradually accumulate, and thus convert what was intended for a running conduit into a stagnant cesspool.

I shall state a few particulars as to the improper construc-

tion of some of the sewers. Take, for example, Great King Street: when it was cleaned out, the declivity to the outfall was so flat that the soil water would scarcely flow. The west division and the west half of the east division falls, or was intended to fall, into the Pitt Street sewer,—not by a curved junction, as it ought to have been, but at right angles, which is a fatal error in the construction. No wonder that the current does not flow when the junction is so imperfect, and the sewer from end to end nearly on a dead level; in fact, the sewer in the east division flows partly west and partly east.

The sewer in the west division of Fettes Row is even in a worse condition, as part of it was built upon travelled earth. It has subsided so much at the west end, that it flows the contrary way that was intended; and being without an outfall at the west or unfinished end, that portion of it has become a filthy cesspool.

From the remarks I have made on the fire-clay pipes for sewage water, I must not be understood as giving a preference to them for public streets, for I am decidedly of opinion that all the main sewers should be substantially built of dressed stone or brick, and of a size to admit of being cleaned out or repaired. For trunk sewers, the average size should be about 5 feet high by 3 feet wide. But for house drainage, I consider the fire-clay pipes to be well adapted.

The ventilation of sewers is a very important point to be considered. The street gratings have generally catch-pits under them, to prevent bad air rising through them; in passing a grating that is not trapped, offensive emanations from the sewer will be both felt and seen, for the discharge of the vitiated air at an untrapped grating will be perceived by a light smoky vapour rising through it, loaded with the gases generated by the process of decomposition. The trapping of these

street cesspools, however, has this disadvantage, that it confines the noxious air in the sewer, and prevents ventilation.

But the ventilation of these subterranean channels is a difficult process. Some engineers have recommended the construction of lofty chimneys; others recommend the street lamp-posts to be cast hollow, and each to have a tube to the sewer to draw off the foul air. Neither of these plans will be found to be generally practicable; but my opinion is, that if sewers are regularly flushed out, the bad air will be carried off. But how is this flushing to be accomplished? It can be effected by fixing water-cocks on the street mains at the upper ends of the sewers, and if these flushing-cocks are turned on as often as the state of the sewers require—say every second day—the solid impurities would thus be scoured out, and the sewers ventilated, so that they could be passed through without endangering the life from noxious gases.

Now that our Water Company have got such an ample supply, it is much to be desired that an agreement were made for the daily flushing out all impurities from the Edinburgh sewers. We would thus get rid of those unseen but subtle causes of disease that flow from every untrapped cesspool into our washing-houses and sculleries; and if an adequate supply of water cannot be obtained by private agreement, a legislative enactment ought to be obtained for that purpose. In Paris, there are about ninety men daily employed in cleaning out, by means of water-flushing, the public sewers of that great city.

The main *trunk* sewer in the Cowgate was built in three sections. The eastern portion, having to receive the water of so many streets, was made five feet high by two feet nine inches wide. The centre portion was made three feet nine inches by two feet wide. The smaller sewers for the steep streets, such as Candlemaker Row and Victoria Street, were

made two feet high by one foot six inches wide, and the branch drains were of various sizes, calculated according to the quantity of water they had to receive. The average depth of the Cowgate sewer is nine feet below the street level, and so soft were some portions of the foundation, that at one part a large sill stone sank deep into the spongy soil, and for fear of endangering the frail old houses along the line, the contractor was taken bound to execute the sewer in short lengths, and to have the sides of the cutting closely shored up.

There was a branch drain from the bottom of each cross street and close along the whole line, and a malleable-iron grating and cesspool. Into these gratings the whole surface water was made to flow. They were all hinged, for the scavengers to clean out the solid matter from the cesspools, and all trapped, to prevent the effluvia getting from the sewer.

No small stones were allowed in the construction of these sewers,—the whole inside faces and joints were carefully dressed, and the sills curved.

The levels were adjusted throughout, so as to equalize the fall from the Grassmarket, at the west end, to the South Back of the Canongate, on the east.

The gradients were as follows :—

| | | | | | |
|---|---|---|---|---|---|
| The fall of the eastern division | was fixed | at 1 | foot | in | 35 |
| " the middle division | " | at 1 | " | in | 55 |
| " the west division | " | at 1 | " | in | 150 |

This last gradient was found to be too flat for the small quantity of water that flowed into it, and the consequence was, the solid matter settled along the bottom at the Cowgate Head.

On my reporting this defect of the flat level and the want of water, the Commissioners of Improvements gave me powers to construct the sewer for Victoria Street with a branch to the well at the head of the Old Bow, and another branch to the Grassmarket well. Sufficient water was thus got for flushing out the solid matter from the head of the main sewer.*

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It occurs to me that if our builder members would transmit to the Secretary of the Institute notes of their mode of operations when engaged on difficult works, detailing the process adopted in overcoming the difficulties, I am persuaded much real benefit would be conferred on the Institute, particularly on our younger members, by hearing practical subjects explained by practical men.

I would likewise urge upon our young members the importance of obtaining a correct knowledge of building materials. I must again appeal to our associate builders to furnish this information, and would suggest that they turn their attention to the strength, durability, and texture of the different kinds of stone used for building purposes. One paper might be devoted to the sandstone quarries; another to the granite quarries of Aberdeenshire; and the subject might be still farther followed out by a paper on limestone, marble, and slate. I would farther beg to suggest to our experienced builders, that from time to time they furnish the Institute with small cube specimens of the best building stones, showing the dif-

* It is not generally known that before this system of sewerage was executed, the whole of the public buildings along the south side of the High Street, namely, the Police Office, the Government Offices in the Parliament Square, Sir William Forbes and Company's Bank, the County Hall, Libraries, &c., &c., all with numerous water-closets, discharged their soil into the surface channels of the Cowgate.

ferent kinds of work—say that one side of the cube be droved, another broached, another polished, and so on, giving a short description of the work, with the expense. A correct knowledge of the different kinds of building stone is of the utmost importance to architects, engineers, and builders.

In conclusion, I will take the liberty of urging on our young members the importance of obtaining information from builders of experience. Whenever a useful hint is given, note it down. As the sketch-book is the companion of the artist, so the note-book and measuring-line ought to be in the pockets of the architects and engineers in every journey they take. If every member of the Institute would consider it his duty to do something to uphold the character and position it has already attained, by regular attendance at the stated meetings throughout the session, and by such contributions as may be suggested by the nature of his more immediate associations, the anxiety of our zealous Secretary would be very much relieved, the Institute would be enabled to maintain its position, and a guarantee would be given of its durability and usefulness for years to come.

Transactions of the Architectural Institute of Scotland.
Second Session, 1851-52.

# No. VIII.

## ON THE RESPECTIVE CLAIMS OF INIGO JONES; DR BALCANQUALL, DEAN OF ROCHESTER; AND WILLIAM WALLACE,—TO HAVE BEEN THE DESIGNER OF HERIOT'S HOSPITAL.

BY

DAVID RHIND, Esq., Architect, F.R.S.E. & F.A.I.S.

[*Read at the Meeting of the Institute in Edinburgh on 26th February* 1852.]

After the valuable communications of Mr Robertson and Mr Laing on the very interesting subject of who was the Architect or Designer of Heriot's Hospital, I would not have brought the matter again before the Institute, had not the Committee thought that they would not be justified in offering a Report until the claims of Inigo Jones and the Dean of Rochester had been more fully investigated. I will therefore endeavour to comply with the desire of the Committee, as I think every member, while the subject is yet before us, should do what he can to prevent our arriving at a hasty and erroneous conclusion.

Confining myself exclusively to the documents that have come down to us, I have been forced to the conclusion that, al-

though Mr Laing has had no difficulty in proving Mr Robertson's claims for Aytoun to be without foundation, he has only himself advanced us a step towards the truth. It may be that there are yet some undiscovered documents tracing the design beyond Dr Balcanquall; but, weighing all that we have now before us on the subject, without making any attempt to form conclusions from vague conjectures, I think we cannot at present refuse Dr Balcanquall the distinction of being the only person to whom we are enabled to trace the original design from which the Hospital has been built.

I will endeavour shortly to explain how I have come to this conclusion, leaving the Committee to judge what value they think should be attached to it.

The points I have endeavoured to investigate in connexion with the subject are,—

1*st.* On what authority Inigo Jones is stated to have been the Architect of the Building?

2*d.* The meaning to be attached to the words 'patterne 'and prescript.'

3*d.* The resemblance of style between Heriot's Hospital and Wintoun House.

4*th.* Whether the architect of a building was at that time the 'Master Mason.'

5*th.* The meaning of the words 'Frame and Model.'

6*th.* The date at which Wallace first began to have any connexion with the building of the Hospital; and,

7*th.* The circumstance that the ground on which the Hospital was built was purchased on the 22d June 1627,* and that Dr Balcanquall on the same day laid on the table a design suitable for the site.

* The ground was actually purchased on the 22d June, but I believe it probable that the arrangements had all been made long before with the

Upon the first point mentioned, I have to notice that in Dr Stevens' History of the Hospital, published in 1845, we find it stated that 'competent judges do not hesitate 'in ascribing the work to Inigo Jones.' In the article 'Architecture' in the Edinburgh Encyclopædia, published in 1830, it is said,—'Heriot's Hospital is known to be a 'design of Inigo Jones. It was begun in 1627, and com-'pleted in 1650. We know of no other instance in the 'works of a man of acknowledged talent where the opera-'tion of changing styles is so evident. In the Chapel win-'dows, though the general outlines are fine Gothic, the 'mouldings are Roman.' In Milizia's well known Lives of celebrated Architects, Inigo Jones gets the credit both of Heriot's Hospital and Holyrood House. Hugo Arnot, in his History of Edinburgh, published in 1779, has stated it to be 'from a plan of Inigo Jones, as is reported.' It will be found also to be attributed to him in various other recent works, such as the Edinburgh Gazetteer, published in 1824, where it is stated to be 'from a beautiful Gothic design by 'the celebrated Inigo Jones.' In Maitland's History, published in 1753, the Hospital is said to have been built 'ac-'cording to a plan of the said Balcanquall;' and Macky, in his Journey through Scotland, published in 1729, also gives his testimony in favour of Balcanquall, adding, 'who was a 'great architect.'

I have thought it necessary thus to quote some of the

knowledge and advice of Dr Balcanquall while he was in London, as we find the following in a letter from him to the Governors announcing his intended visit; and it is worthy of note that while he expresses so much anxiety about purchasing the ground, and having everything ready, there is no allusion of any kind made as to the getting of plans for the building. He begins by stating his intention to visit them in spring, when the roads are passable, 'before 'which tyme I desyre to be an humble suitor to you that you would be pleased 'to think of some fittest place for building and other accommodations, that so 'at my coming I may find things in all possible forwardness.'

authorities on the subject, as we find them scattered over the different histories of Edinburgh and the Hospital itself, and I think I have given enough to show that the further back we go the more distinctly we find the design attributed to Balcanquall, '*who was a great architect;*' and on the contrary, the earliest authority in favour of Inigo Jones is of a much more recent date, and it also qualifies the statement with the unsatisfactory addition of '*as is reported.*' I do not wish, however, to attach too much importance to such authorities in the present investigation, but to be guided only by the facts as we find them recorded at the time the Hospital was commenced and during its progress, putting on these the plainest interpretation I believe them capable of bearing, as it is in this way only that we have, as far as at present appears, any chance of arriving at the truth.

I have been unable to trace Inigo Jones' name in connexion with the Hospital from any authentic source to an earlier date than the middle of last century. I will therefore make no further allusion to him at present, from a desire to avoid vague and indefensible conjectures, founded either upon a supposed similarity of style with other buildings he erected elsewhere at a much earlier date, or upon an imaginary intimacy with George Heriot and the Dean of Rochester; and I may at once state that I have been able to find no work of any kind or date in which either Wallace or Aytoun are mentioned as having been the Architect of the building.

The chief point on which I differ from Mr Robertson and Mr Laing is the meaning to be attached to the words 'patterne 'and prescript' in the following passages from the minutes of the meeting of the Governors of the Hospital, held on the 22d June 1627:—

'Therefore they agree and condescend that six accris of the same, 'or thereabouts, be bought from the thesaurer of the guide town for the

'use of the Hospital appoynted to be foundit be unquhille George 'Heriot, and that the same be situate therein, and BUILDIT *conforme to* '*the* PATTERNE *of the same* GIVEN *by the said Dean of Rochester.*' 'And 'ordaines that the saide work be gone in hand with all expedition, and 'that all materiallis be boucht in due season, to the effect they may '*begyne to bigge and build* upon the 15th day of March next, and all 'to be done *conforme to the patterne and prescript* MAIDE *be the said Dean* '*of Rochester.*'

Before offering any interpretation of these quotations, it is of some importance to keep in view that the meeting bears date the 22d June 1627, and that it was only at a subsequent meeting on the 13th July of the same year that the statutes were *for the first time* brought before the Governors, as we find from the minute that on that day 'compeirit the Dr Bal-'canquall, Deane of Rochester, and for fulfilling of the trust 'reposed in him be unquhille George Heriot, producit the 'buik of statutes underwritten, subscrivit with his hand and 'seale this 13th July 1627.'

The meaning of the word *patterne*, according to Johnson, is 'the original proposed for imitation,' 'the archetype,' 'that 'which is to be copied;' and Webster defines a pattern to be 'anything cut or formed in the shape of something that is 'to come after it.'

The same authorities define the meaning of '*prescript*' to be a direction, or a model prescribed.

Keeping in view these definitions of the words, and that Dr Balcanquall was present at the meeting to suggest any alteration, had the minutes misstated the facts, I think it must be clear to any one who will read it with attention that the words 'BUILDIT CONFORME TO PATTERNE' cannot apply to any thing but the *structure;* and that when it is determined to 'BIGGE AND BUILD conforme to a patterne MADE *by Dr Bal-*'*canquall,*' it can only mean that he was the Designer of the Building. It cannot have had reference to the statutes, even

if the words used could bear that interpretation, because, as we have seen, they were not even written till a later date, and we find besides, as quoted by Mr Laing, that Dr Balcanquall was afterwards paid a sum of money for 'laying down the 'Statutis of the said Hospital.'

The next point is the resemblance between Wintoun House and Heriot's Hospital; and I find it necessary here to begin by stating that I know of no evidence that Wallace ever was connected with Wintoun at all; and even although he had been so, it would not, as I shall afterwards more fully explain, justify Mr Laing in the decision he has come to, because I believe Heriot's Hospital to have been first built, and that it would therefore be with quite as much justice that we add the resemblance between the two buildings to the testimony in favour of the Dean of Rochester, who, when in Edinburgh, would probably visit his brother, the minister of Tranent, and be shown by the Earl of Wintoun the design of the house he had begun to erect in the neighbourhood, (and which I believe, from its appearance now, had been at that time standing for some time unfinished), and his advice possibly taken as to an improvement or alteration in the design of the part that was uncompleted.* I believe it was probably to this we owe

* It may, perhaps, make us wonder less at the contradictions we constantly find in the way of our accurately determining the date of buildings erected 200 years ago when we see how little care is taken to prevent a similar confusion with regard to those of the present day. Stewart's Hospital, now being completed at the Dean, Edinburgh, with the date 1849 cut in stone on the front, was accurately surveyed during last year by the men engaged on the Government Survey, and yet, on the map now published as the result of their labours, it has been thought more accurate entirely to leave it out and show the ground as it was five years ago and can never appear again, than put a building on the map that was not in every respect completed. In this way the map of Edinburgh must want the columns erected on the Calton Hill as a portion of the National Monument, the National Gallery begun on the Mound, and the various buildings this year and last in progress throughout the town; whereas it would surely have added much to the historical value of a Government publication if all these had at least been inserted in block, and marked—'in progress of execution.'

the circumstance that in the chimney stalks and upper floor of Wintoun House, (and only in the upper parts, built, as I believe, after Heriot's Hospital was in progress), there is that strong resemblance to the English Elizabethan detail of the same period, which is also so conspicuous throughout the Hospital. I can trace the style and detail no further back in Scotland than Heriot's Hospital itself, and therefore, even setting aside altogether the facts as I have quoted them from the minutes of the Governors, it appears to me much more likely, from Balcanquall's long residence in England, that these peculiarities originated with him than with Wallace.

I have made a very careful examination of Wintoun House, and find the view I have here taken very strongly borne out by the fact that while in Heriot's Hospital, Glasgow College, and Argyle's House, Stirling, the same style of detail is found to prevail throughout every part of the building, from the base to the chimney stalks, in Wintoun House there is a sudden change into the style adopted in these buildings only after it was up two storeys on the north and three on the south front. Up to these points there is not one detail in common with the Hospital or the other works I have named, everything being of the most common place kind; but here the change can easily be traced, and there is introduced that resemblance to the detail of Heriot's Hospital which, I agree with Mr Laing, it is not possible to overlook. I think it probable that at this point there was a change both in the architect and the design, and that the upper floors and towers were completed by some one who was both acquainted with the peculiar features of the style then being introduced from England in Heriot's Hospital, and had access to the plans, and knew the intention with regard to the completing of that building.

After what I have said, it will not be expected that I

should inquire further into the points of resemblance between the Hospital and Wintoun House, having stated my belief that, in the parts where there is a resemblance, Heriot's Hospital was first built, and also because, so long as both architects are equally unknown, even were it greater than it is, and carried out from the base to the roof, it would not in any way advance us in our present inquiry.

Although, however, I can find no evidence to prove that Wallace ever was at Wintoun at all, it is not impossible that he may have been the builder employed, and was there introduced and recommended to Dr Balcanquall, either by his brother or Lord Wintoun, as one in every way qualified to be the builder employed at Heriot's Hospital. I need scarcely say that this is mere conjecture, but, whether appointed in this way or not, there is no doubt of the fact that he was the first builder employed on the Hospital, and was uninterruptedly engaged upon it from January 1628 to the time of his death. I feel satisfied, however, that he was nothing more than the builder, and I conceive it to be strong evidence of this that the very first entry of his name in any way as connected with the Hospital is in the accounts of date the 22d January 1628, long after the plans had been agreed to ; and it also strengthens the belief that this was the commencement of his services that the sum paid was for '*ane lang lyne for measuring the ground.*'

In stating Wallace to have been only the builder of Heriot's Hospital, I feel that I would not do him justice without adding that he appears to have had very unusual latitude of power, with regard both to detail and construction, even to the extent of almost doing the duty of Master of Works, in so far that he seems to have had no one over him in executing the design ; but still he was in my opinion nothing more than the head of the masons, the same as the head of the carpenters, as we

find them together without any distinction in the following entry in the accounts on the 22d January 1628,—' Item, the ' same day to the 'master mason' and 'master wright' and ' their servants to drink when the ground was spelked.'

Although I would not consider that a slight resemblance between two buildings was enough of itself to justify the conclusion that they were the work of the same architect, it has been suggested to me by Mr Robertson, the convener of our committee, that there would be found some resemblance in the detail to the last addition that was made to Caerlaveroc Castle, and although there certainly is, I do not consider it strong enough to justify any conclusion as to the architect having been the same. This is not of much importance, however, as the works at Caerlaveroc were not commenced till ten years later, or in 1638, and as the name of the architect has not come down to us, any decision as to the style would leave us very much where we are.

Although I can only trace a very slight likeness to Caerlaveroc, it is impossible not to be struck with the very remarkable resemblance to the details in Argyle's House, Stirling, and Glasgow College, which were built at the same time, or very shortly after, the former bearing over the door the date of 1632, and the latter having been commenced about the year 1630. I have never examined these buildings without being struck with the similarity of style, and I trust others may yet be successful in discovering who designed them, as I believe it might greatly tend to enlighten us on the subject of our present inquiry. Their names are for the present, however, involved in quite as much obscurity as the architect of Heriot's Hospital.

The next point to be considered is, whether the architect at that time was called the ' Master Mason,' although it does not, I think, very greatly affect our inquiry, as, by whatever

name you call him, the records leave little room for doubt that from the 22d January 1628 up to the time of his death Wallace had the sole charge of the execution of the work at Heriot's Hospital. It is a subject of some general importance, however, and I will therefore endeavour shortly to state why I hold the opinion that the 'Master Mason' was not at that time the 'Architect' of the building.

In the charter granted in 1628 to Sir William St Clair we find it stated that, 'for advancing our craft and vocation 'within His Hienes kingdom of Scotland, and furdering of 'policie yairintill, and maist part of our predecessors, for 'themselves and in name and behalfe of our bretherene and 'craftsmen, with express advice and *consent of William 'Schaw, Maister of Wark to His Hienes umquhille dearest 'Father,* of worthey memory,' &c. &c. And farther on in the same it is continued—'We all, with one voice, have ratified 'and approven, and be these presents ratifies and approves 'the foresaid former letter of jurisdiction and liberty made 'and subscrivit be our bretheren *and His Hienes umquhille 'Maister of Wark for the time.*'

On the 28th day of December 1598 we also find the following printed and circulated among the masons of Scotland:—'The statutis and observances to be observit be all 'the *Maister Masons* within the realme, set down be *William 'Schaw, Maister of Wark to his Majestie,* and the general 'warden to the said craft, with consent of the masons after 'specifiet.'

The statutes and ordinances, which I will not take up your time in quoting, follow, and are signed by 'William 'Schaw, *Maister of Wark.*'

I give these quotations fully, because they show that in 1628, and before that time, the name of Master of Work was known and in use. William Schaw was appointed his Ma-

jesty's Master of Works in 1584, in room of Sir Robert Drummond of Carnock. He died in 1602, and was immediately succeeded by James Murray, who I find was his Majesty's Master of Works in 1628, the year in which Heriot's Hospital was commenced, and it removes all doubt in my mind that William Wallace was not an architect that we find him appointed Master Mason in 1617, '*because the said William* '*Wallace, after sufficient tryell tane be James Murray, his* '*Majestie's Master of Works, anent the qualification of the* '*said William* to use and exercise the said office, he is ' found able and qualified to use and exercise the same ' sufficientlie.'

It must also be kept in mind that Robert Milne, who, again, was Wallace's immediate successor as his Majesty's Master of Works, and received his appointment so early as December 1631, could not have been considered an architect, as we find him at a later period engaged, in his capacity of ' Master Mason,' in carrying on the building of Holyroodhouse under Sir William Bruce, surveyor of works to his Majesty, who is known to have been the architect employed, the name of surveyor being now, apparently for the first time, used instead of master, probably because that was the name given at the time to his Majesty's architect in England—a situation to which Inigo Jones was appointed 16th March 1615, and held at the time Heriot's Hospital was built.

It may be of some importance to observe further, that William Wallace was paid his wages weekly, and we find in the minute after one of these payments an entry of a sum to ' William Aytoun, his Extraordinar,' or, as I read it, Foreman, which leads us naturally to the conjecture that this was the same William Aytoun who at the death of Wallace was appointed the Master Mason at the Hospital. Indeed I have no doubt of his having been the same person, and that he owed

his advancement to the value of his services while on the work, with the addition perhaps of a recommendation from Wallace to the Governors at the time of his death. While on this part of the subject, I may also mention that there was a clerk of works in constant attendance, as we find 'Andro 'Davidson, who attendes the work,' in regular receipt of his weekly allowance; and it is not the least unaccountable feature of this investigation, that while we can do little more than guess who was the architect, there seems no name too insignificant to be recorded in the accounts that have been preserved, down even to 'William Watson, for keeping the wark 'on Sunday.'

I will only further, in connexion with this part of the subject, which I trust I have sufficiently explained, again refer to the quotation I have already made from the minutes, in which there is no distinction made between the '*Master 'Mason*' and '*Master Wright*,' and remind you at the same time that at the present day the Queen's Builder continues to hold his office under the name of 'Master Mason.'

The next point to notice is the meaning of the word 'Frame,' and I do not consider, with Mr Laing, that there is any importance to be attached to it, or that the payment entered to Wallace in August 1629 for the 'ordinary service 'in the frame and building of the Hospital this year bygone,' can have been for a design prepared previous to June 1627, or two years before, but means only that as 'Master Mason' he had charge of the moulds, models, &c. necessary for the construction and execution of the works during that year.

With regard to the last point I have stated as requiring explanation, our present information will not allow me to do more than offer a conjecture; but if Dr Balcanquall got the design for the Hospital from a friend in London, his ignorance to a great extent of what was required would compel

him to make his sketches for an isolated situation, such as that fixed upon; and on the other hand, if he designed it himself, his plans would be in progress while the negotiations were proceeding for the purchase of the ground.

I have now brought before you all the information we have on the different points requiring investigation, and I will now only give in a few words the conclusion I believe we must come to if we confine ourselves strictly to a careful examination of the documents that have yet been brought to light on the subject; and I do so in the hope that it may at least prove of some assistance to the committee, in preventing an erroneous decision.

1*st.* That we have at present no authority of an earlier date than the middle of last century in which Inigo Jones is in any way alluded to as having been connected with the Building.

2*d.* That Wallace and Aytoun were the Builder and Foreman employed at the Hospital, and had no connexion with it till the 22d January 1628, or more than six months after the plans had been finally approved of.

3*d.* That it is not possible, as contended for by Mr Laing, to apply the words '*buildit conforme to patterne,*' to anything but the STRUCTURE.

4*th.* That the Hospital being by the minute of Governors ordered to be built 'conforme to patterne MAIDE be 'Dr Balcanquall,' can only be interpreted to mean that it was he who supplied the design.

With our present information, then, and setting aside conjectures, I can arrive at no other conclusion than that the Design of Heriot's Hospital was furnished by the Dean of Rochester; but, at the sametime, although I feel forced to

this conclusion from the documents before us, I cannot resist expressing my belief that it was the work of some distinguished architect in London, or elsewhere, from whom he received it, and probably by mistake allowed it to be entered in the minutes as his own. Had the Hospital been built earlier in the century, I would have felt more strongly inclined than I am to believe it to have been a work of Inigo Jones; but it seems to me scarcely credible that he would have designed Heriot's Hospital at the same time that he built the Banqueting House at Whitehall, and that his enthusiasm for Classic Architecture led him to erect a Corinthian Portico in front of the Gothic Cathedral of St Paul's. The time may possibly come when further light will be thrown on the subject; but whether it ever is so or not, it is satisfactory to think, that as concerns the building itself, it is of little importance, as all our researches and endeavours to find out who was the Architect of Heriot's Hospital can only be from a desire to do him honour, by associating his name with one of the finest monuments of art of which this country can boast.

# No. IX.

# ON RURAL ARCHITECTURE,

WITH ILLUSTRATIONS.

BY

W. J. GRAY, ARCHITECT, COLDINGHAM.

COMMUNICATED BY W. WALLACE FYFE, ESQ.

[*Read at the Meeting of the Institute in Edinburgh on the 26th February* 1852.]

THE authors of the present communication, contributing respectively the text and its accompanying designs and plans, impressed with the neglected condition of the important subject of Rural Architecture, are satisfied that in directing the attention of the Architectural Institute of Scotland to what has perhaps too long remained the humblest walk of their refined profession, they are adopting the best course for promoting an infusion of ornate and elegant tendencies amidst the strict utilitarianism of those farm and cottage improvements which of late years have begun so extensively to diversify the Scottish landscape.

Of the fifty designs and plans included in the illustration of a work by Mr W. J. Gray, now passing through the press, and edited by the present correspondent of the Institute, the whole fasciculus is herewith put in circulation, but it will be

for the Publication Committee to select such examples for their Transactions as they may judge most illustrative of the various sections of rural edifices or erections now brought under consideration.* Exclusive of villas or mansion-houses (which, as falling under the scope of ordinary rules and practice, are not introduced into the work in question), the sections now treated in detail comprise—

1. Cottage accommodation.
2. Farm Houses.
3. Farm Steadings, and
4. Manses, Schools, and public Country Edifices.

Our rural architecture is not in the advanced condition of those higher branches of the art which have classical models and conventional traditions to direct them. Its great struggles for improvement are evidences of some dire necessity existing within it for better combinations of fitness and refinement.

If architecture, indeed, could be said until recently to have embraced the objects just included in our fourfold classification, a retrospective glance at its condition would afford the most instructive commentary on the nature and benefits of the improvements now so generally in progress. It were unnecessary to revert for this purpose to a period when the mansions of the great were strewn with rushes instead of being laid with carpets, and lighted through horn shavings instead of being glazed with glass, as we know at one time to have been the case. John Ray, the naturalist, travelled into Scotland nearly two centuries ago, on a voyage of discovery, such as any adventurous traveller might now take into Central Africa, and in his itinerary, dated from Dunbar, 17th August 1661, he writes that—

* Ten have been selected, and appended to this paper. (Plates III. to XII.)

'The Scots have a custom to make up the fronts of their houses, 'even in their principal towns, with fir boards nailed one over another, in 'which are often made many round holes or windows to put out their 'heads. In the best Scotch houses, even the King's palaces, the windows 'are not glazed throughout, but the upper part only; the lower have 'two wooden shuts or folds to open at pleasure and admit fresh air.'

It is thus we may trace to the necessities of these times the tastes and embellishments of the present; the 'half-tim-'bered' style of rural edifices and '*cottages ornées*' brought so much into vogue by the genius of Ricauti being in many points identical with that which formed the butt of English ridicule on the Scots two hundred years ago.

A century later, when the wooden portion of house windows had fallen into disuse, it was, however, remarked, regarding the rural parish of Dunsyre, where the atmosphere, though good, was moist, and rheumatism, with nervous disorders, were found to be very prevalent, that these things were partly attributable to the want of a circulation of air in the houses, the windows of which had formerly had moveable timber leaves below, and glass above, which had been replaced by sash windows scarcely admitting of being opened. Ricauti had not arisen, and, ignorant of sanitary conditions, our ancestors thus unhesitatingly sacrificed them to appearances.

In Lanarkshire, towards the close of last century, the cottages, generally, had fallen into that dilapidated condition without, and that want of judicious arrangement within, which may be said to have characterized our rural dwellings to the present time. The houses were all exceedingly damp, the windows for the most part glazed, but few of them made so as to open, and the common people universally slept in close timber beds, few of them being sufficiently convinced of the vast advantage of having their bed-clothes regularly exposed

to the fresh air, or of the danger of sleeping in places so confined. The box bed, to this day, sadly hampers the construction of rural abodes; the occupant cannot be brought to relinquish it, and the rural architect is forced to contrive accommodation for it within any set of walls designed to suit the circumstances of, at least, the Border peasantry. Wooden windows and ventilation were formerly prerogatives of the better class of houses only; the poorer sort were altogether too inferior for such advantages, being literally mud hovels.

At the close of last century, in the village of Dornock, Dumfriesshire, consisting of about two dozen houses scattered along the side of the military road which passes through Annandale, the manse, and two other dwelling-houses inhabited by their proprietors, were the only buildings of two stories in height covered with slates—the rest being all mud houses covered with thatch. The same proportion of houses and hovels distinguished every village in the country. The whole cottages, and most of the farm houses, as in parts of the north of Scotland and throughout all Ireland at the present day, were built of mud or clay. When plastered or properly finished within (of which many were by no means thought unworthy) these barbarous dwellings were considered to be extremely warm and comfortable; nor are they even now without their advocates amongst our 'cottage improvers.'

'Wood and wattled houses such as our forefathers built,' says a Lancashire correspondent of Mr Chadwick, in the General Sanitary Report, 'are the driest and warmest of all. 'Brick is inferior in both these requisites of a comfortable 'house; but stone, especially the unhewn stone, as it is neces-'sarily employed for cottages, is the very worst material pos-'sible for the purpose. I prefer,' he adds, 'the Irish mud 'cottages.'

In Sussex the inducement of being able to embellish the

surface with these mud erections at the cost of £10 was not long since held out by certain advocates of cottage improvement; but in Scotland it is happily the case that nothing save humorous traditions of the manner of erecting them is now to be found. The foundation dug, and laid with a row or two of stones, there was procured from some contiguous pit as much clay or brick-earth as would suffice to form the walls, a sufficient quantity of straw or litter to mix with the clay, and upon a given day the entire neighbourhood, male and female, would sally forth armed with pitchforks, spades, or other implements, and commence to carry the materials, leaving half-a-dozen, perhaps, of the most experienced hands practically to engineer the building of the walls. In this manner the walls of our 'ancestral halls' were usually finished within a few hours. The parties engaged in the work then celebrated its completion—to which, in the southern vernacular, was awarded the title of 'a daubing'—with a dinner and a dance, thereby converting into a frolic this somewhat dirty and disagreeable job.

Yet even then a change for the better had passed over the face of the country as contrasted with the time when, saving ecclesiastical edifices, there were no buildings existing but the fortress and the cottage. Of this condition of things, Moreham, near Haddington, must have been an example, as its name implies the existence of some ancient castle, with its *more* (large), *ham* (village), long since swept away. These, had they remained, then, would have formed a striking contrast with the farm-houses of Legerwood parish, described at the date of the first statistical account (Sir John Sinclair's), as of two stories in height, handsomely and comfortably fitted up within, with a square of offices, and a kitchen-garden contiguous, whilst the houses of the hinds were snug, dry, and comfortable, affording to the honest labourer better domestic

accommodation than the greatest nobleman enjoyed five or six centuries previous, in the most spacious of the feudal castles whose strength we admire in ruins.

It is indeed worthy of remark, that in now dictating the amelioration of the labourers' condition, the improvements in agriculture are but restoring what they were once the cause of taking away. The first results of the improvement of tillage in Scotland, especially in Forfarshire and the central counties, were the enlargement of farms, the restriction of tenants from subsetting, and the removal of cottagers from the lands. Up to that time, every farm had a large proportion of useful cottage dependents—families, enjoying each a house, garden, and cow's grass, and subject to the call of the farmer for performance of labour, at the rate of wages current in the country. The extension of farms and extinction of cot-towns drove out this class of farm labourers, and rendered country servants what they still are—where no care is taken to establish them in respectability and comfort—bad, scarce, and expensive. Towards the end of last century most of the cot-houses in the parish of Whittingham had been pulled down—one farmer only holding by the old notion, that it would contribute most to his convenience to have labourers located around him, and retain his cottiers.

But cottage reform is no new cry in Scotland. It was raised by the minister of Auchterhouse in 1795. He complained that the villages in his parish were, like all the villages in the country, built in the most irregular manner, consisting generally of houses of the meanest construction. He urged that it was much to be regretted that the lower class of the people—a numerous, useful, and virtuous body—were not more comfortably lodged, and that, after toiling hard during the day, they should at night be involved in smoke and filth. He accurately predicted the continuance of this evil until the

proprietors of land should resolve to build at their own expense all the houses necessary for the accommodation of the people upon their estates. Let us hope that along with the philanthropic feelings that appear to be at length aroused upon the subject, the cottage improvers of this age will also find pleasure in contributing to beautify our rural scenery with evidences of their taste. Prior periods have not been totally devoid of brilliant instances of this enlightened spirit. At the village of Balledgarno, in the Carse of Gowrie, the late Lord Kinnaird, so early as 1790, had made the commencement of his plan for rebuilding that elegant little village, by pulling down the old and building a new one of slated houses, with two fine apartments each, to accommodate sixty families. The present Lord follows worthily in the footsteps of his predecessor. The Highland Society's competition of plans for the cottage improvements of the past year, the premium for which was awarded to the cottage designs got up for Mr Home of Wedderburn, and submitted along with the present paper, having rested betwixt the present designs and those of the noble lord.

The Bamborough Cottages, figured amongst the plates, (PLATE III.) are also remarkable examples of cottage improvement at an early date. The venerable Archdeacon Thorp, in 1809, had to contend, as now, with the prejudice in favour of close beds, connected with a severe climate, and the old insufficient houses. Space was reserved for the reception of these cumbrous and inconvenient enclosures in the improved Bamborough Cottages, under the protest that it should be subsequently adapted, which it never has been, for more convenient furniture.

It cannot therefore be denied that from time to time improvements were attempted in the construction of dwellings for the peasantry. But it was not until the Reverend Dr

Gilly, so late as 1841, with an energy of which it is impossible to speak too highly, laid the foundation of a popular movement, by the publication of his well known work, 'The 'Peasantry of the Border,' that proprietors and the public were fully aroused in their favour.

The Earl of Rosebery is entitled to the credit of having been the first in Scotland to bring forward practical illustrations of cottage improvement, in the cheap and simple cottages constituting the little village of Dalmeny. This was done by his Lordship at the general meeting of the Highland and Agricultural Society in 1839. He permitted the plans and specifications of his cottages to be published for the information of other proprietors, and they appear in the 44th number of the Society's Transactions.

The movement once commenced, many cottages were shortly erected in the Border district on the Bamborough model. These may particularly be mentioned: those of Lord Crewe's trustees at Thornton, and those on the property of the Marquis of Waterford at Ford; the latter in a range of eight, having one room each, 18 feet 4 inches × 15 feet 7 inches, with porch and pantry, and being built of stone, slate, and timber, at a cost of £54 : 9s. per cottage. Others in a more ornamental style, with two rooms (and back offices) 17 feet × 12 feet 2 inches, and 16 feet 4 inches × by 12 feet 2 inches, cost £71 : 10s. The villagers, in an address voted by them to the noble Marquis, described their 'streets,' once full of dunghills and stepping-stones, as transformed by these improvements into beautiful cottage rows, walks, and terraces. Of Etal, that lovely and reclaimed retreat at Lord Frederick Fitzclarence's gate, upheld by Dr Gilly as the pattern of what a village ought to be, we may say, however, that the majority of the cottages, though smothered in picturesque beauty, are hardly susceptible of architectural improvement short of entire

reconstruction. Still, Etal was a rare and early example of the effects of beautifying our rustic abodes, for the very character of its inhabitants, once notorious over all the Border as engaged in the differential smuggling of salt, spirits, &c. has changed completely under the influence of floriculture. A group of cottages which had recently been put in repair at Etal attracted much notice during the Highland and Agricultural Society's meeting at Berwick-upon-Tweed, having a few weeks before been miserable hovels.

As instances of more complete cottage reform we may, however, quote:

A range of ten cottages, with offices, of stone, slate, and timber, erected by William Moffat, Esq., Ednam, Roxburghshire, each of one room, 22 feet × 16 feet, and a chamber above, at a cost of £53 each.

In Durham and Yorkshire cottages had been erected—each of three small rooms, with pantry and wash-house; the kitchen 14 feet × 13 feet; bedroom 13 feet × 11 feet; and another bedroom 11 feet × 7 feet, all of stone, slate, and timber, £77 : 19 : 6 per pair.

Near Burnham, Norfolk, cottages in pairs, each having two rooms, kitchen 12 feet × 10 feet, bedroom 8 feet × 6 feet, with small bakehouse (an English requisite) of bricks, tiles, and timber, had been put up at £70 per pair; others of one room each, 12 feet × 12 feet, bakehouse, pantry, and two upper chambers, of same materials, at £90 to £100 per pair.

Mr Baker Cresswell, at East Lillburn, had built improved cottages, distinguished by an arrangement for disposing of ashes, &c., through loopholes in a wall built to conceal all that was offensive; the wall itself running parallel to the cottages, but upon the opposite side of the roadway. We can only say that, in the burgh of South Queensferry, this same expedient operates as a most intolerable nuisance.

In Berwickshire, cottages in pairs had been erected on the estates of Spottiswoode, Laws, Ladykirk, and Marchmont, on estimates varying from £48 to £53 each. Seven designs for these are published by Messrs Blackwood.

The Cottage Improvement Society of Northumberland took the field in October 1841. In the report put forth by their committee, they endeavoured to suggest the grand desideratum of 'the best cottage at the lowest price.' Plans of four are shown with a principal room, 15 feet × 7 feet, and two large beds behind a partition, each having a second apartment or back shed, 6 feet × 7 feet, wide enough to hold one bed across; the cost being £54 : 9s. each cottage. The 'best cottage at the lowest price' was a single one with upper room and detached back premises, such as store room, 10 feet 2 inches × 5 feet, cost £67 : 12s. In juxtaposition with these, however, are sketches by 'a working man,' where designs of a far more meagre character are estimated to cost, for one apartment 18 feet square, stair, and offices, and large attic bedroom overhead, £159 : 6 : 7 per pair, or £79 : 13 : 3½ each. The elegant Howick Cottages answer much to these dimensions; but from the large dormer windows, which cause considerably more expense from the construction of leaden gutters in the roof, must have cost a good deal more than this. It may be known to the members of the Institute that his Grace the Duke of Northumberland has just issued orders for the erection of one thousand cottages on his estates in the above district.

The model examples of cottage improvement in England are generally held to be—

1. The erections by the Earl of Stradbroke at Henham, near Hailesworth, in Suffolk.

2. Those by the Earl of Leicester at Holkham.

3. Those of Mr Benyon de Beauvoir, a village of fifty cottages, called Culford, five miles from Bury St Edmunds; and,

4. The Labourers' Cottages, erected, altered, or improved, on the estate of Gregory Gregory, Esq., at Harlaxton, near Grantham, to which the late Mr J. C. Loudon directed such particular attention.

The view just essayed of these noble and widespread efforts of cottage improvement would, however, be utterly imperfect were we to omit reference to 'The Plans and 'Suggestions for Dwellings adapted to the Working Classes, 'including the Model Houses for Families, built by com- 'mand of H. R. H. the Prince Albert, K.G., in connexion 'with the Exposition of the Works of Industry of all 'Nations, 1851. Published by the Society for Improving 'the Condition of the Labouring Classes,'—and so creditable to the honorary architect, Henry Roberts, Esq., F.S.A. An opportunity of inspecting the model building put up by his Royal Highness opposite the gate of the Great Exhibition at Knightsbridge, having been so universally enjoyed by last summer's visitors to London, it would be unbecoming to occupy the time of the Institute by canvassing or describing its merits.

The examples of cottage architecture brought forward on the present occasion comprise—

1. Farm Cottages erected at Billie Mains, in the parish of Bunkle, for Mr Home of Wedderburn, the cost of which averaged £160.
2. Steward's Cottage at the same place, of which the cost was £132.
3. A Cottage at Huxton, for the same proprietor. Cost £162.
4. North Falaknowe Cottages, built for Mr Home. £144. (Plate IV.)
5. Eyemouth Mill Cottages, for the same gentleman. Each about £120.
6. Cairnhill Cottages, also for Mr Home. Each £132.

7. Milldown Cottages, also for him. Each £118 : 10s. (Plate V.)
8. Restonhill Cottages, for Mr Home. £73.
9. East Reston Mill Cottages, on the bank of the water Eye, Mr Home. £192. (Plate VI.)
10. Swinewood Mill Cottages, do. do., on a low site. £196.
11. The Improvement of Cairncross Cottages, still Mr Home's. Costing in all £155.
12. Plan for Improvement of four Cottages belonging to W. Dickson, Esq. of Whitecross, Coldingham.
13. Allanbank Mill Cottages, built for Sir George Houstoun Boswell, Bart., on the Blackadder, at Edrom.
14. Sunnyside Cottages, the property of William Wood, Esq., situated on the public road, near Hounwood. Cost £60.
15. Sunlawshill Cottages, built on an elevated situation in Roxburghshire for William Scott Kerr, Esq. of Chatto and Sunlaws.
16. A Gardener's Cottage, intended also as a Gatehouse, erected for the late Thomas Begbie, Esq. of Mains, near Chirnside. Cost £218. And finally,
17. A Tradesman's Cottage, or Cottage Villa.

The groups now put in circulation from the forthcoming volume are therefore both varied and numerous, and are perhaps entitled to the more especial consideration from the fact of being nearly, if not entirely, buildings actually executed. It may probably also be taken as some attestation of their merits that the gold medal of the Highland and Agricultural Society was awarded to the chief of these cottage designs.

The following account of the Billie Mains farm cottages was prepared by David Milne, Esq. of Milngraden, as a specimen page for Mr Gray's volume.

'These cottages are in the parish of Bunkle, and shire of Berwick; 'they are on the farm of Billie Mains, the property of W. F. Home, 'Esq., and in the occupation of Mr Thomas Allan, the principal tenant 'on the estate of Billie.

'The old cottages occupied by the servants were mere hovels, the 'walls being composed of clay and round stones—the roofs of thatch— 'the floors inside of a mixture of mud and ashes. The plate represents

'the appearance of these old cottages, with the pools of stagnant water 'before the doors, and shows on the same sketch the cottages which in '1848 came in their place.

'Whilst the social comforts of all the families, twelve in number, 'have, as may be well supposed, been greatly promoted by the change, 'it is gratifying to add that the increased accommodation has led to 'laudable efforts on the part of the little community to afford to their 'children the blessings of education. Billie Mains is at a considerable 'distance from any school, and, to remedy this disadvantage, some of 'the better instructed among the grown up men and women, soon after 'the new cottages were completed, volunteered to teach a class in the 'ordinary branches of parochial education, including a Sunday school. 'One of the garret rooms was cheerfully given up for this purpose, and 'a supply of books and stationery from the proprietor and tenant re-'warded and encouraged this laudable movement.'

The report of the cottage inspectors for the Highland Society bore that the whole of the cottages on Mr Home's estates were of the most substantial description, forming a very great improvement on those they had replaced;—indeed superior to anything of the kind that had been seen in Berwickshire. The most noticeable features were:—the full accommodation afforded—two separate apartments below and one above, in which beds can be placed—and all having a loft the full size of the cottage, with convenient access to it, and sufficient height betwixt the floor and the cupple baulk to admit of the space thus afforded being really available to the inmates. Then the provision of a small scullery and milk place as separate apartments, the kitchen being thus enabled to be kept more tidy, and the cow's produce turned to better account. Fixtures which seemed to be much prized by the people were a furnace-pot in the sculleries, and cast-iron kitchen grate, with oven at one end and boiler at the other. The inspectors also report favourably on the attention bestowed on suiting the plans of these cottages to the actual circumstances and wants of the class of people for

whom they are intended, particularly the addition of a fixed iron bedstead in the smaller room of the most recently erected cottages, since these migratory yearly servants usually possess but two bedsteads of their own. The floor of the under storey being carefully laid with flags or bricks, is also commended as a very great improvement; whilst the paving of the roadways in front and behind, the courts of the outhouses, and the spouting of the eaves, are regarded as keeping the cottages cleaner and drier than could otherwise be the case. The provision of pigstye, coal cellar, and rain-water barrel, with ashpit and privy for each, is likewise approved of, because, where the latter is common to two or three, it is observed not to be kept clean. The drainage and ventilation of all the cottages is reported as being ample. The plan which gave most pleasure to the inspectors was that of the cottages at Milldown—(PLATE V.) They objected to the thorough draught caused by the back door at Billie Mains, which in practice caused the front one to be little used. The cost of most of these cottages had been considerable from the attention bestowed on outward appearance, to which, however, the convenience and comfort of the occupants have in no instance been sacrificed; and the plan and general arrangements would be equally complete were the workmanship ever so plain. The object aimed at in the improvement of existing cottages had been the introduction of the same features as in those newly erected, by raising and flagging the ground floor, introducing brick partitions and additional fireplaces in all the bedrooms, plastering the walls, and putting in a loft. The same number of outhouses had been added, and the same paving of the roadways and courts. The inspectors say—

'In conclusion, we cannot refrain from expressing the gratification 'which we have experienced from the inspection of so many cottages

'of such a superior description. It has long been matter of observa-
'tion that the cottages of the farm-servants are quite inferior to the
'other farm buildings in this country. This is every way to be re-
'gretted, and the more so as there is not a more orderly and well-
'deserving class of people in the whole community. It is our belief
'that all attempts to improve their habits as regards decency, cleanli-
'ness, and neatness will be comparatively fruitless until they are pro-
'vided with better dwellings and other conveniences.'

Such is the substance of this official report. It may therefore be permitted to speak for the cottage plans in question, or they for themselves, whilst we pass on to another phase of the subject.

Scarcely less interesting, even as a popular question, and certainly not less important as a matter of utility, the more extended erections of the farm claim also a share of attention. Historically, however, we have only to notice, that, in succession to the castles and the convents of yore, those meaner buildings clustered around them, or existing in separate 'towns,' constituted the only permanent structures of the country. Whilst the land was still greatly wooded, the rural abodes were to a great extent merely temporary wigwams, the blame of which John Mair, the historian, distinctly imputes to the unwillingness of proprietors to encourage tenants to erect decent and commodious dwellings for themselves. After the Reformation, the spoliation and destruction of the religious houses appears to have contributed in a singular degree to improve and alter the Rustic Architecture of Scotland by an unexpected supply of materials, and a diffusion of new ideas of domestic comfort. From the Reverend Dr Skene Keith's 'Description of the smaller sort of farm houses and offices in 'Scotland,' and the 'Rural Recollections' of George Robertson, Esquire (1829), referring chiefly to Ayrshire and the Lothians, it appears, that, although where small farms had been generally thrown into larger holdings, very considerable improvements

had taken place within the past half century in Berwickshire, the Lothians, and the principal agricultural counties of the north and west, the existing 'onsteads' were not very long ago mostly of a very mean description. The houses, consisting chiefly of a line of one storey buildings, from 30 to 40 feet long, by 15 broad, exhibited many cases in which substantial tenants were not only destitute of domestic comfort, but of sufficient accommodation and shelter for their families or stock. The kitchen and family apartment alone, the two principal rooms in the centre of the range, were warmed by fires, but that of the kitchen was chiefly frequented by the entire household. Here a huge o'erhanging chimney environed the blazing hearth, presenting, on two or three of its sides, those settles or seats identified with the joys of 'the farmer's ingle.' If by any chance the parlour floor might be constructed of deal, that of the kitchen was sure to be only beaten clay. The height of the ceiling did not exceed eight feet, and, innocent of lath and plaster, the rafters were exposed overhead, and generally converted into shelving. The houses adjoining the dwelling-house in the same row usually constituted the farm offices—the barn being attached to the parlour end, the byre to that of the kitchen, with frequently a door of communication for facility of access in milking the cows. Here the poultry had usually the advantage of the warmth overhead. The stable lay beyond; but both byre and stable were generally very deficient in racks, stalls, and mangers, whilst the loft or platform over the latter too often had to accommodate the ploughmen with lodgings. The barn-yard occupied the rear of this low range of buildings, and the midden-stead, if not actually established in front, disputed possession of the rear, and exhibited a slovenly and ignorant waste of its better properties, being suffered to accumulate its gases, and dissipate them in the air through-

out the entire year, whilst the farmer 'laid the flattering 'unction to his soul,' that this 'pestilent congregation of 'vapours' was conducive to his health.

By a very obvious improvement in what might thus be termed the *farm-row*, rather than the *farm-steading*, the barn, turned at right angles to the dwelling, formed a half square, generally so situated as to screen the windward exposure. It is now deemed preferable that the barn itself should be protected. It is, therefore, as a catholic rule, placed north and south, for preservation from wet and damp. This extension of the accommodation led to the filling up of three sides of a square, the east, west, and north, nay, sometimes the whole four, with offices; taking care to keep those of the south, if carried up at all, extremely low. In many instances the farm-house still remained in front, in others it occupied the most eligible of the angles, with ready access to the rear. But as it was commonly recommended that the south of the square of offices should simply be fenced in, and left open to the sun for warmth, the favourite position for the farm-house, and its immediate smaller offices, at least in Northumberland, was directly in front of the principal square; this being the plan recommended in Bailey and Culley's 'Survey 'of Northumberland' (1813), and, as in the whole instances now laid before the Institute, with one exception, invariably adopted, although perhaps open to the objection of projecting a shade over the southern entrance or aspect of the yard.

The modern farm-house should be calculated to yield the amount of accommodation required by a respectable family, the head of which invests in business perhaps as large a capital as the merchant or tradesman occupying a suburban villa of similar appearance to a commodious farm residence. It is now usually detached, though situated at no inconvenient distance from the steading, and is in a great measure

proportioned in appearance to the circumstances of the tenant, and the extent, the importance, or the affluence of his position. Thus, whilst the plainest farm-house now erected would be generally provided with at least two living-rooms, besides kitchen, scullery, and conveniences, and perhaps six bedrooms, the sole addition to these accommodations in a first-class farm-house would consist in its being distinguished by two principal or public rooms (the dining-room and drawing-room), besides the snug family or breakfast parlour. The accommodations of the farm-house, in short, must be characteristically ample, without anything superfluous.

Our sets of designs and plans in illustration of that prominent feature in the landscape, the chief domestic building of the farm, embrace four distinct varieties of farm-houses. Situated one and all in Berwickshire, a county where, even so long back as the commencement of the century, the farm rents ran from £200 to £1200, and where, since the advent of improved modes of agriculture, the farming has certainly lost nothing in the scale of magnitude—these will most probably exemplify completely the whole desirable forms of the home of the Scottish farmer. They represent—

1*st*. The Farm-House of East Blanerne, in the parish of Bunkle, the property of the Reverend Sandys Lumsden, built on an excellent site facing the south, to the west of the farm offices, and close upon the Dunse branch of the North British line of railway, for the late David Blackadder, Esq., the eminent surveyor. The advanced gable end, containing, on different floors, dining-room and drawing-room, confers the benefits of central access at its angle, and considerably relieves the monotony of what must otherwise have been a plain square front, by permitting a good central grouping of the chimney-tops, while sheltering the entrance door from

the severe eastern blasts. The ground floor accommodation is ten feet in height. The dining-room is lighted from west and south ; the parlour from south and east—the parlour, as head quarters of the mistress of the establishmnent, being placed in immediate communication with the store-room and dairy, and, through the latter, with the kitchen, &c. The kitchen fire, being in a central position, dispenses the benefit of its warmth to the cold lobby and stairs. A stair of droved flags descends to the cellars, which has three tiers of stone shelves. The cellar floor, as well as those of the kitchen, scullery, closets, and dairy, are formed of native flag stones. The back door, descending from the scullery by a small flag stone step, has in its immediate vicinity the ashpit and coals. The opposition of the front and back doors is such as to secure perfect ventilation, without creating a direct thorough draught. The chamber floor is provided with a lighted bed-closet over the lobby, and a landing over a portion of the staircase. The well-proportioned drawing-room, lighted by two windows from the east, and one from the south, enters from this landing. The addition of a china-closet is provided over a portion of the dairy. A bath and water-closet are accessible by a flight of steps leading from the parlour stairs. Besides the little front bed-closet, three bed-rooms—two large, and one of smaller dimensions—are formed, with a short passage communicating with the landing on a range of space over the dining-room and kitchen. A servants' room on the chamber floor is completely walled off from the sleeping apartments of the family, and is accessible by the back stairs. The entire cost of this building was £500.

2*d*. Broomdykes Farm House is a large-sized example, square on the plan. The office-buildings on the rear are not, however, carried up higher than the chamber floor. Broomdykes, the property of Sir George Houston Boswell, Baronet,

is situated in the parish of Edrom. The house faces the south, and stands immediately in front of the farm-offices. The front and back elevations, though plain, are relieved from a commonplace appearance by variations introduced in the form of the central windows. The ground plan accommodations comprise lobby, stairs, closet, and cellar; dining-room, drawing-room, and parlour; kitchen-passage and closet; kitchen, scullery, pantry, and servants' room—all of appropriate dimensions. The chamber plan—staircase-landing, with store and water-closet, two front bed-rooms, with handsome light dressing-closets, and two back bedrooms.

*3d.* Blackpotts Farm House, with some pretensions to elegance, for a building of its class, was erected in 1848 by W. F. Home, Esq. It is situated a mile and a half south of St Abb's Head, and in some respects is a modification of the farm house first described. It stands immediately in front of the farm-offices looking towards the south, environed by shrubbery on the west, and its eastern elevation looking into the garden, with a very harmonious effect derived from the central clustering of the chimneys. (See PLATE VII.)

*4th.* Turtleton Farm House was also erected by W. F. Home, Esq., on his property of that name, in the parish of Dunse. Perhaps it aspires more than the other elevations beyond the beaten track of rural architecture, presenting double windows, mullions, gablets, clustered chimneys, pointed finials, and other ornaments. It is square on the plan, and stands north of the Dunse turnpike, in front of the farm-offices, which face the south. The arrangement of the ground plan is simple, giving lobby, staircase, closet, &c.; two front rooms, large kitchen, scullery, pantry, and dairy. The chamber floor possesses three bedrooms distributed over these, and a large closet over the lobby. The cost was only £392.

Much talent has been bestowed towards laying down a

Model Scheme of Farm Offices. But it must be acknowledged that the diversities of arable and pasture lands, and the sizes, soils, and situations of farms are so infinite, that it would be no easy matter to invent a plan for general adaptation. The improvements suggested have indeed been signalized by striking marks of skill and ingenuity; yet, in pursuit of some particular leading object, points of equal importance in the design of a comprehensive set of farm-offices have generally been lost sight of. Thus a plan devised for roofing in the entire square of offices, as in the inhospitable climate of Poland, and accompanied by arguments of economy and advantage scarcely resistible, has been found to prove as incomplete in its ground arrangements as it was perfect in the roof! In other cases, where attention has been mainly directed to extend the motive power by lying shafts and accommodation for minor machines, sometimes the minor conveniences have been multiplied to the exclusion of those of major importance! With regard to feeding accommodation, the steadings of Auchness and Myremill, in Wigton and Ayrshire, have been put forward by Mr Caird as models. But they will be found to contain nothing beyond what the author of the present designs has for years been practically engaged in adapting to Berwickshire, Roxburghshire, and Border farms. The main point is to render the accommodations complete, according to the wants of the farm. Being complete, they must also be compact. To accomplish these objects, on which the due economy of time and labour essentially depend, the feeding-houses and stables, though they ought generally to be situated apart (in the cattle and clean courts respectively), should alike be easily accessible from the barns, and so, indeed, should be all parts of the establishment from one another—only avoiding all thoroughfare calculated to disturb the quiet of feeding animals. The corn-ricks again, threshing-

mill, barn, and granaries, should be in proximity; as also should the straw-barn, and straw or feeding yards, not only that double cartages might be avoided, but that the stable manure may be easily transferable into the cattle courts, and the joint produce thence into the dung heap.

Our practical examples, illustrative of these principles, upon the respective sites to which they apply, consist of—

1. Sir George Houston Boswell's Broomdykes Farm Offices, —a large square, traversed around its interior by 20 feet, and intersected centrally by 15 feet causeways.

2. Blackpotts Farm Offices—W. F. Home, Esq.—traversed by one grand lateral causeway only, and completely drained and watered. Cost of erection £816. (PLATE VIII.)

3. Cairnhill Farm Offices, similarly traversed, and very ample in its feeding accommodations. (PLATE IX.)

4. Sunlawshill Farm Offices, presenting a combination of the advantages of the two last in respect to water and storage.

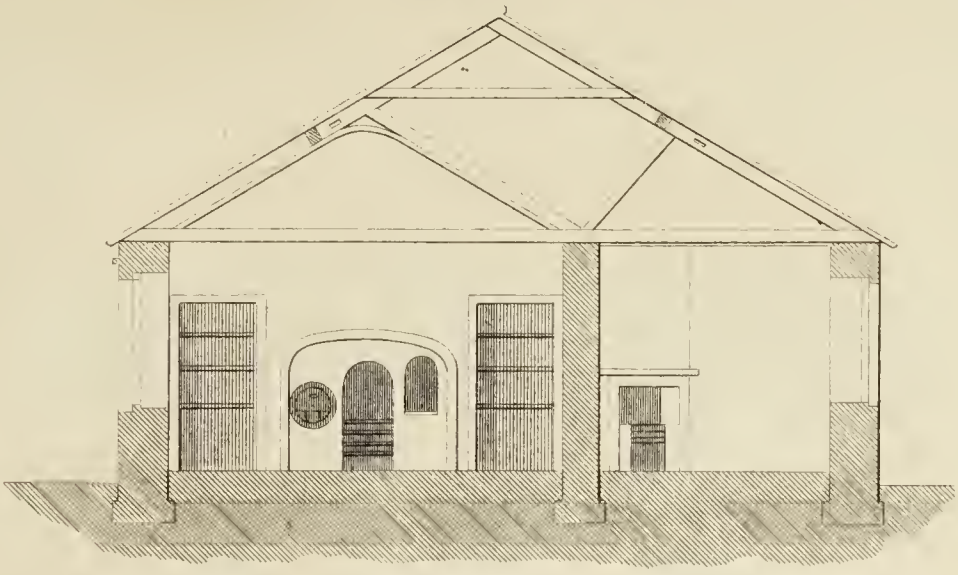
5. New Mains Farm Offices, a square designed in 1849, and now in process of erection, penetrated by an archway passing into an open court fronting the range of cattle courts and sheds—the other usual accommodations occupying the front and sides of the square.

6. Farm Offices, designed for James Mack, Esq., for the farm of Press, near Coldingham, traversed laterally as at Blackpotts, Cairnhill, and Sunlaws, but with the protection of the entrance archway, as at New Mains; supplied with water troughs, and having the turnip stores which intervene betwixt the cattle courts perforated with apertures to the feeding cribs. (PLATE X.)

Finally, it might be presumed that the Manse and School Designs, partaking more of the character of public buildings,

might present a fairer field for launching forth into Architecture of a more ambitious style. But the age is so entirely bent on doing good upon principles of economy and retrenchment, that even here it is insuperable, to avoid unnecessary cost. The remarkable number of illustrious men, the sons of ministers, whom, more especially, the manses of Scotland have sent forth to fill the most exalted offices in the United Kingdom, and to reflect back honour on their native land, would seem to dictate something like a national pride in dignifying and adorning these abodes of learning and piety. The designs and plans now circulated refer to the Manse of Bunkle (PLATES XI. and XII.), which cost £795, and Paxton Female School, erected by W. F. Home, Esq., in the village of Paxton, for the benefit of the children there. The estimate amounted to £300. The stone was, however, derived from the grounds of the proprietor, on the banks of the Whitadder.

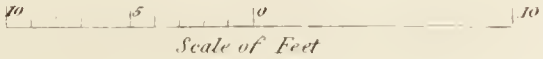
Having thus imperfectly presented a view of a somewhat extensive experience in Rural Architecture to the notice of the Institute, the writer trusts, that if he has left the designs and plans to speak largely for themselves, he may be held justified in judging that they come before those infinitely better able to appreciate them than himself. An ardent desire to attract professional notice to the whole question of our Rural Architecture, and to enlist architectural sympathies in the extensive movement now in progress, alone actuates an endeavour which he is fully sensible might better have been reserved for one more fully versed in technicalities, and perhaps less trammelled in taste by practical considerations, to which habitual devotion to Agricultural Science obliges him to attend.



SECTION ON A.B.

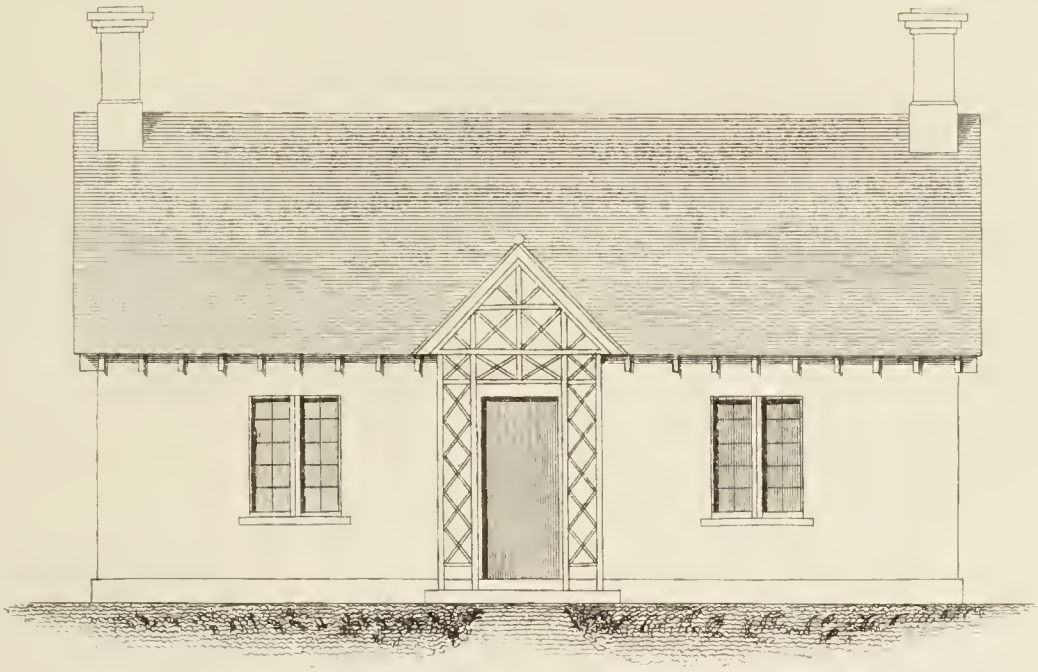
ELEVATION

GROUND PLAN

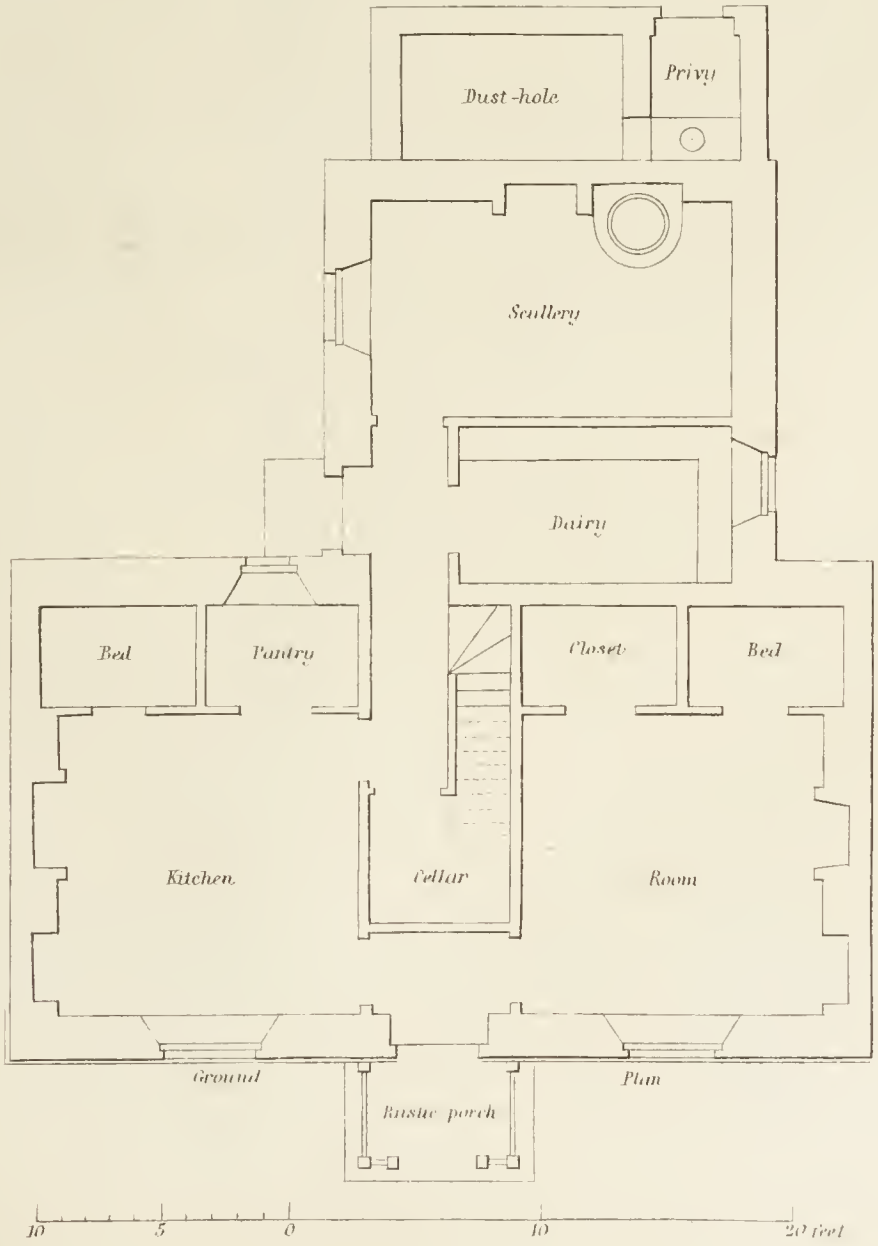



Scale of Feet

NORTH FALAKNOWE FARM COTTAGE. (ERECTED 1846)

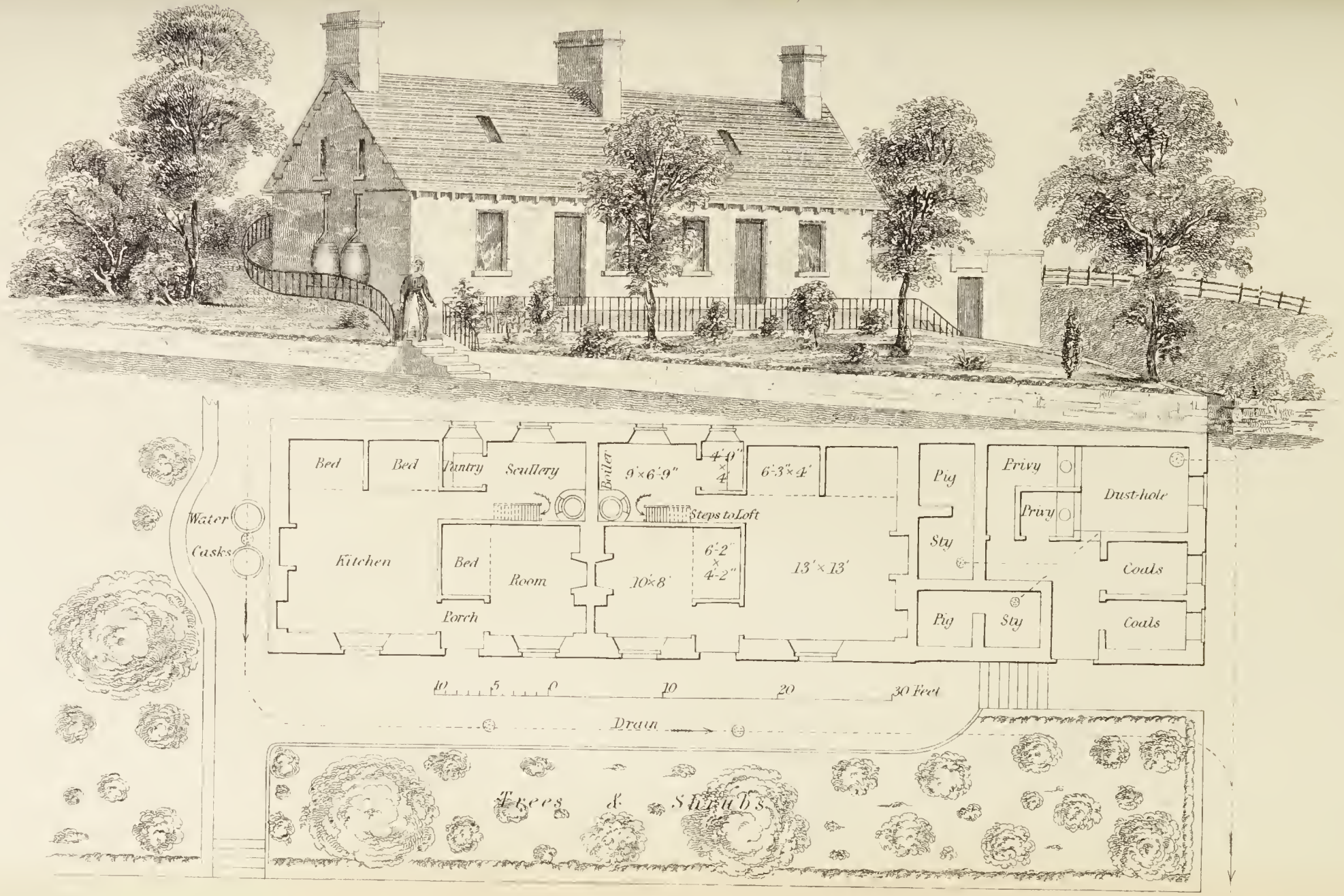


South Elevation



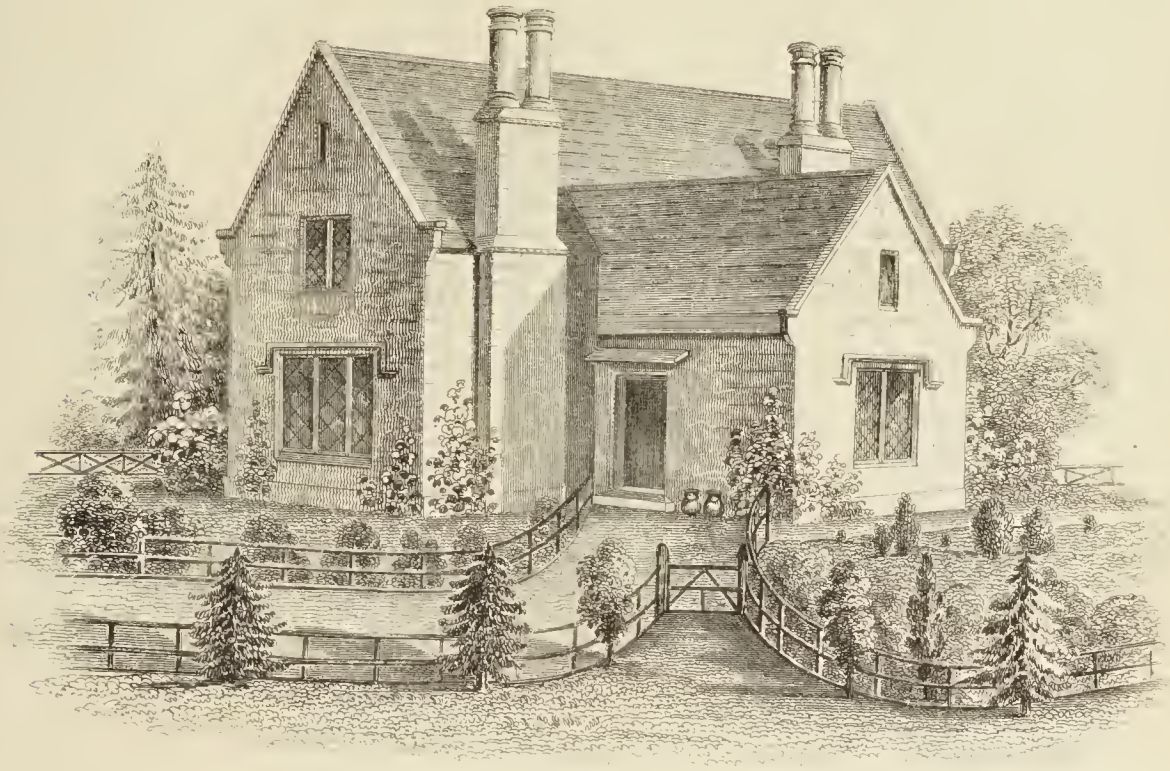

Ground Plan

# MILLDOWN COTTAGES, (ERECTED 1850.)



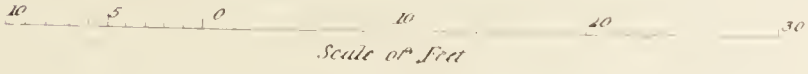

Wm. Gray del.

W.H. Evans s

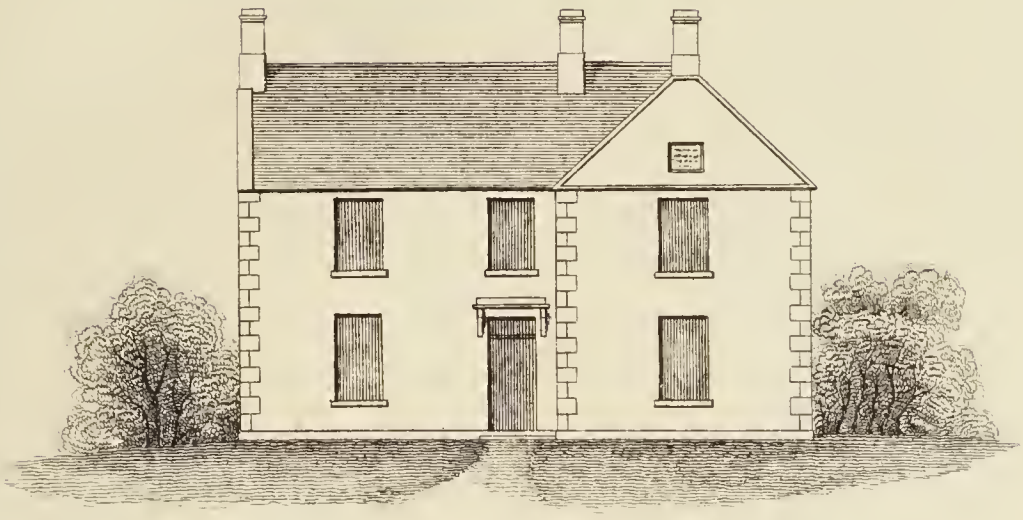


Room
Privy
Ash pit
Closet
Bed
Bed
Lobby
Scullery lighted from the roof.
Dairy
Pantry
Kitchen

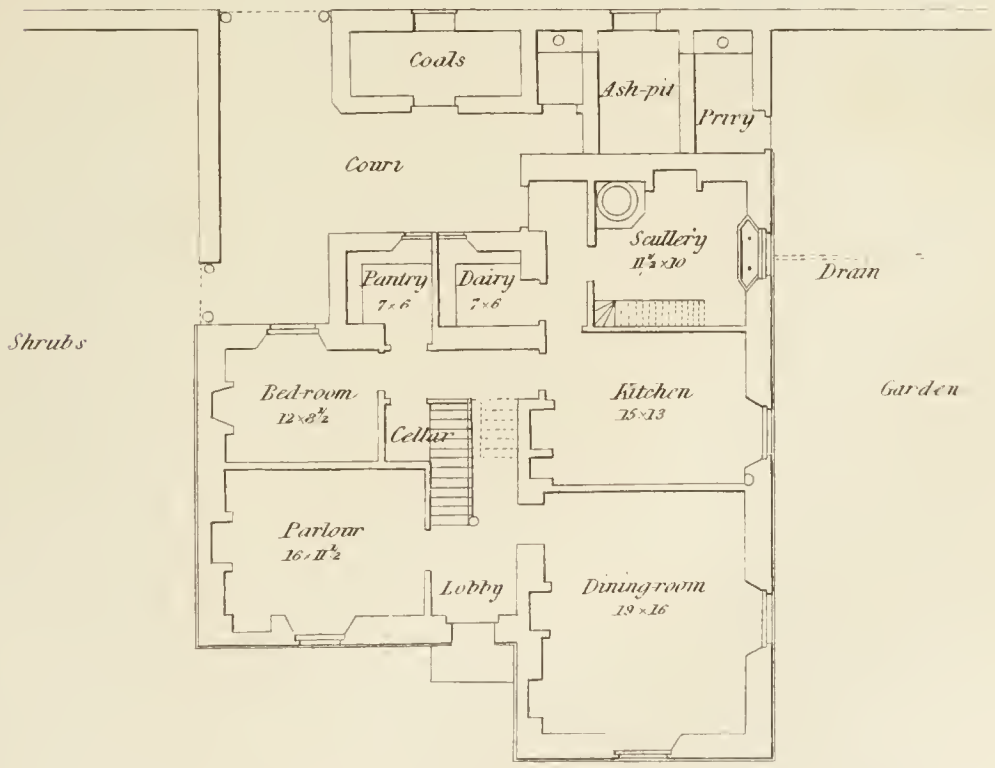
GROUND PLAN


10
5
0
10
20
30
Scale of Feet

## PLAN OF BLACKPOTTS FARM HOUSE ERECTED 1848.



SOUTH ELEVATION




PLAN OF THE GROUND FLOOR

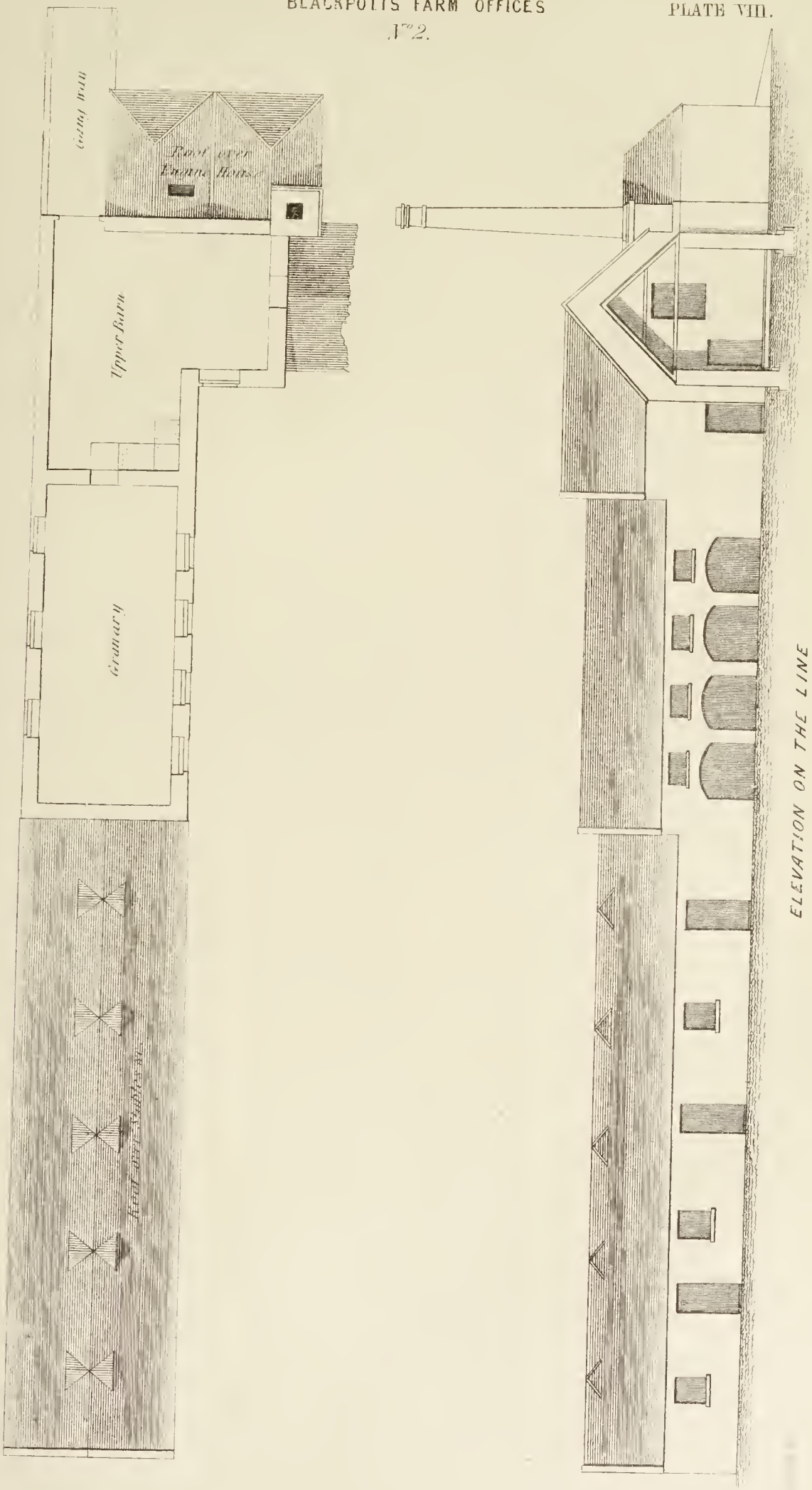
Wm. T. Gray del.

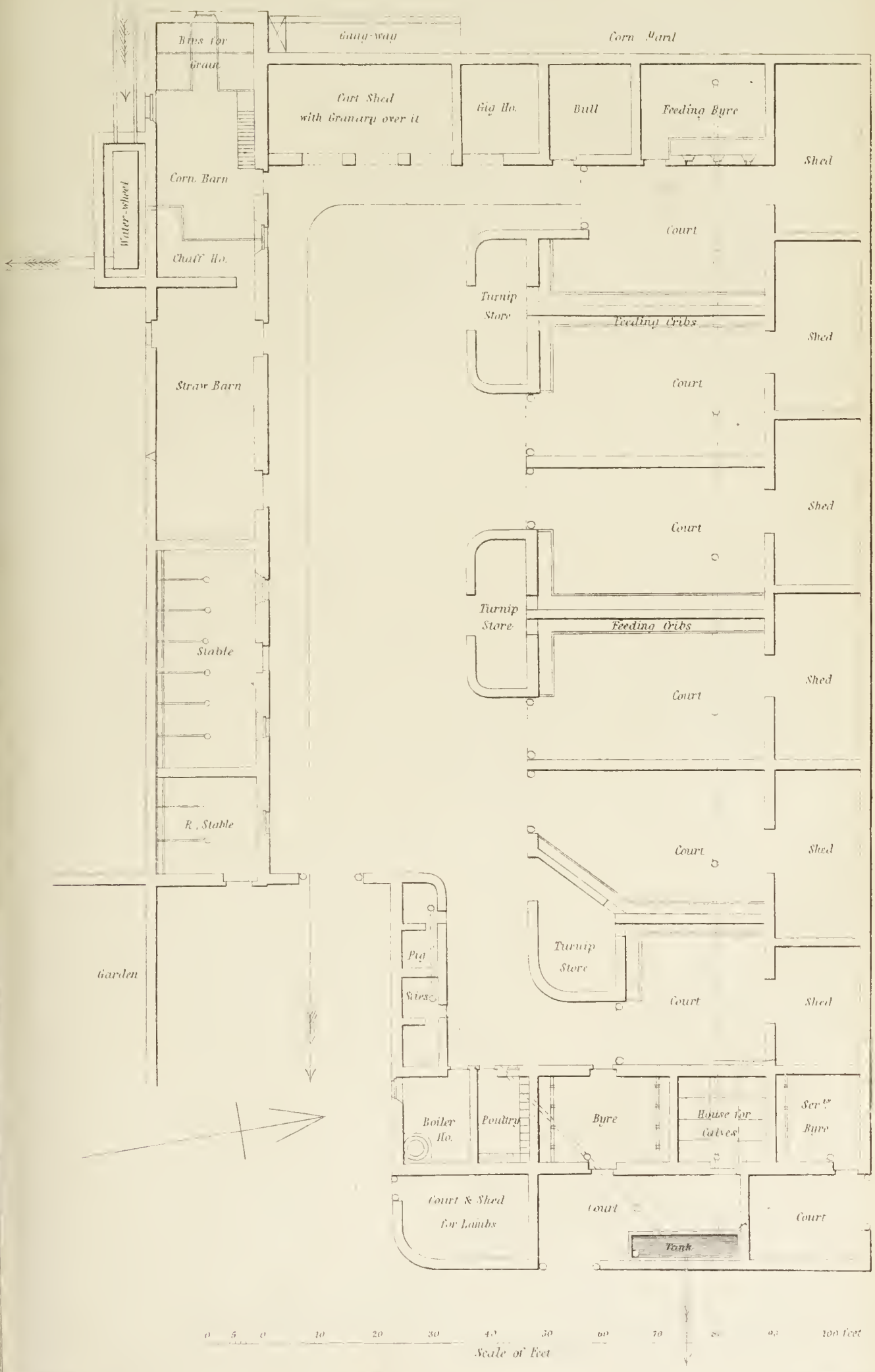
L 816.

BLACKPOTTS FARM OFFICES

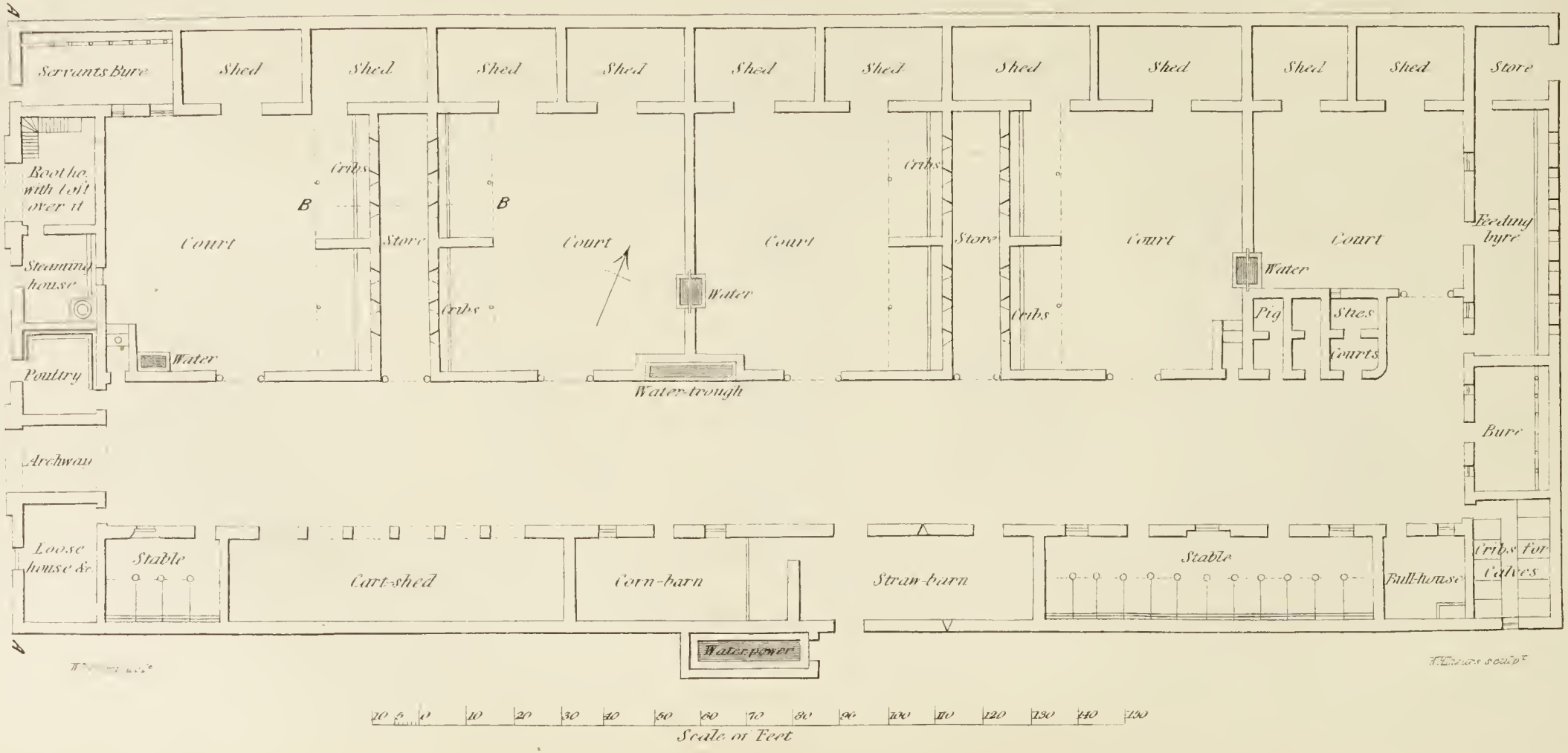
No 2.

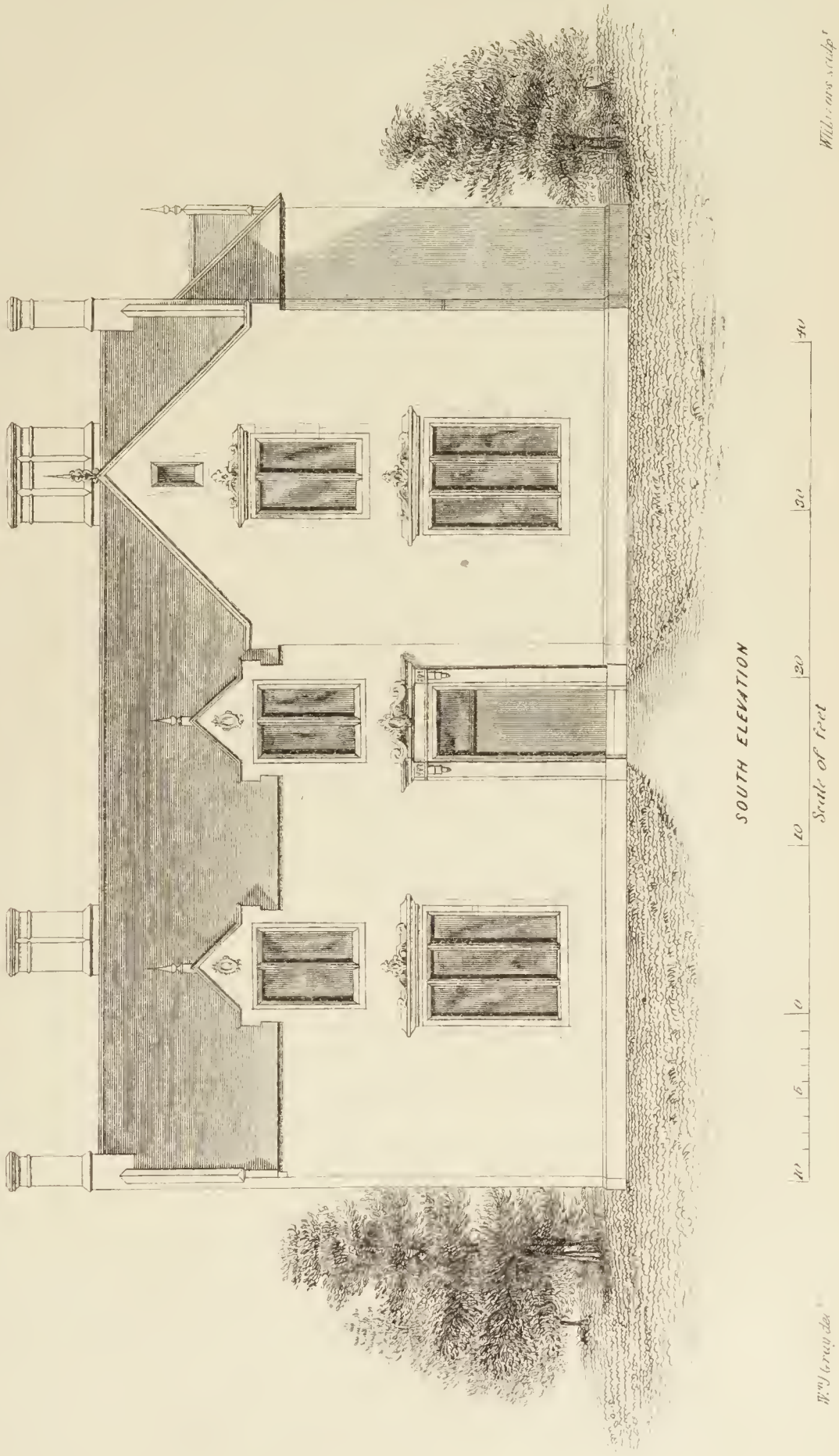


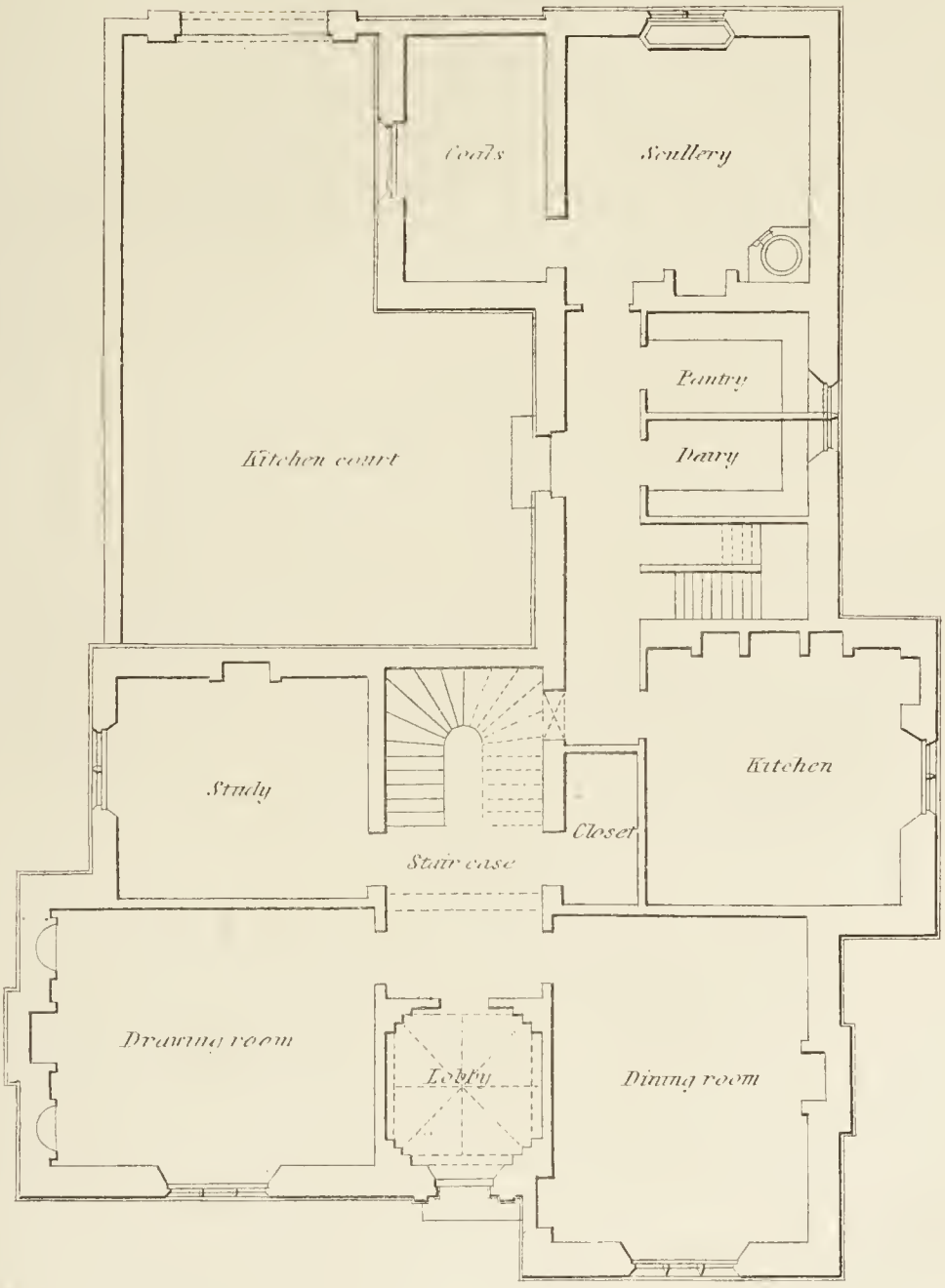



Bins for Grain
Gang-way
Corn Yard
Cart Shed with Granary over it
Gig Ho.
Bull
Feeding Byre
Shed
Water-wheel
Corn Barn
Chaff Ho.
Court
Turnip Store
Feeding Cribs
Shed
Straw Barn
Court
Shed
Court
Turnip Store
Feeding Cribs
Stable
Shed
Court
R. Stable
Court
Shed
Turnip Store
Garden
Pig
Sties
Court
Shed
Boiler Ho.
Poultry
Byre
House for Calves
Serv^ts Byre
Court & Shed for Lambs
Court
Court
Tank
0 5 10 20 30 40 50 60 70 80 90 100 feet
Scale of Feet

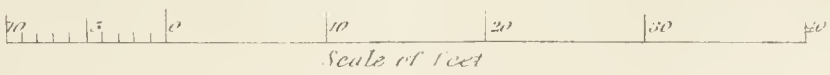
# PLAN OF FARM OFFICES Nº I.




BUNCLE MANSE 1846.
SOUTH ELEVATION
Scale of Feet
10
0
10
20
30
40
Wilkinson sculp.
Wm. J. Gray del.




PLAN OF THE GROUND FLOOR




F. T. Gray del. H. Gilbert sculp.

## No. X.

# A COMPARATIVE ESTIMATE OF MURAL DECORATION,

AS PRACTISED IN OUR OWN COUNTRY AND ON THE CONTINENT OF EUROPE, ACCOMPANIED WITH SUGGESTIONS AS TO THE METHODS BY WHICH PROFESSIONAL ARCHITECTS MAY IMPROVE THIS DEPARTMENT OF NATIVE ART.

BY

THOMAS PURDIE, ESQ.

[*Read at the Meeting of the Institute at Aberdeen, the 8th January* 1852.]

THE desire to decorate his dwelling with objects suggestive of pleasing associations is characteristic of man at every stage of civilization, and in every station of life. The savage Indian, when he suspends in his wigwam the tomahawk and the hairy scalp,—the hunter, when he surrounds himself with memorials of the chase,—the warrior, when he arranges on his walls the weapons which he has worn on many a hard fought field,—the peasant, when he embellishes his whitewashed cottage with the rude prints of some well known tale,—no less than the man of wealth and refinement, when he adorns his ceilings and walls or fills his

spacious saloons with the productions of the pencil, the chisel, or the loom,—act from that common impulse of our nature in which all the fine arts have their origin.

To enter on a defence of the fine arts in general, springing as they do from a feeling so universal in its operation, and in its nature so closely interwoven with man's mental constitution, might seem at any time an unnecessary task; and certainly no such defence is needed at the present day. The utilitarian spirit which would refuse the fine arts a place among the higher agencies which benefit mankind—a spirit which, at one period, possessed certain classes of the community—has been cast out by the influence of a more expanded culture, and is now to be found only in the minds of that sordid and illiterate portion of society who are altogether incapable of considering the subject in any one of the many relations which it presents.

But in the progress of civilization, arts which were originally one and the same have come to be separated, and a division of labour has thus been established in exact correspondence with the increasing wants of the different communities. On searching the records of art to a date not very far distant, it will be found that Sculpture, Painting, and Architecture were frequently practised by the same hand. In our days, however, these have not only ceased to be exercised by the same professors, but painting itself has been divided into many distinct and limited departments. Among other divisions which have arisen, a broad line has been drawn between the style of painting which is connected with decoration, and that which belongs to high art. This division is perhaps arbitrary rather than natural, and it might be difficult to state shortly in what the one or the other consists; but the details lying within the domain of each are too well known to require definition. It is to the former division that our

attention shall be mainly directed in the following remarks; and in its vindication a few words may not be unseasonable, for there are not wanting those who, while they admit the claims of high art to our best consideration, treat mere decorative painting as unworthy either of study or of notice.

Decorative painting has claims on our regard in common with all the arts. Mr Garbett details at considerable length an ingenious theory of the ideal, which makes it consist in an exaggeration of the points of difference—common to mankind as distinguished from the lower animals. Some may doubt whether this hypothesis satisfactorily explains the nature of the ideal beauty of *form;* but there cannot be a question that such a theory, if practically applied to the *mind,* would lead to its ideal perfection; and in this light it suggests a conclusive argument for cultivating the arts generally. For, indeed, it seems little more than enunciating a truism to assert that we shall rise higher in the scale of beings the more we cultivate those powers of the mind by which man is distinguished from the lower animals—the more exalted shall our nature become as we expand those intellectual tastes, and increase those moral sensibilities which constitute the grand difference between the civilized man and the savage. Art, then, even within the humble range which forms the specific subject of our remarks, is of itself a great good, as its necessary tendency, wherever it is practised, is to elevate and refine.

But Mural Painting has special claims which are deserving of attention. It forms the best, and indeed the only practical school in which to educate designers for our manufactures. A boy cannot at once, on leaving a school of design, assume the place of an experienced draughtsman; he must have some intermediate occupation to give him manual dexterity—to enlarge his ideas—and to teach him the power

of adaptation; and if this employment is not to be obtained in decorative painting, I know not where it is to be found. It is quite notorious that at the present day all the best designs for our paper-hangings, and even for our printed and woven fabrics, are supplied by France, and the preparation of these has become a regular profession in Paris. Now, the excellence of French design, as applied to manufactures, is to be attributed in a great measure to the attention which decorative painting has for centuries received at their hands. There is no branch of art which calls into play a greater variety of faculties than this. To attain to excellence as a decorative artist, a man must have a lively fancy, a correct taste, great powers of invention and adaptation, and a ready command of his pencil.*

The profession may now be modified by a division of labour, but, as originally practised, the decorative artist must have been able to paint fruit, flowers, landscape, the human figure, raffaelesque ornaments, ornaments and figures *en grisaille,* and to combine the whole in an artistic and effective manner. The patronage bestowed on decorative art in France reared a host of men, many of them possessed of the qualifications I have described, whose versatile talents were ready to be applied to articles of commerce whenever France became a manufacturing or commercial nation. This fact has, in one instance, been well illustrated in our own times. The French paper-hangings were always far in advance of the English goods of this class, but their excellence was not so marked till within a recent period. In consequence of the political troubles in which France has been involved, the Government works in progress have from time to time been suspended, and numbers of decorative artists, thus thrown out of employment, have become designers for the paper-stainers. A great im-

* See Plates, and description of them in Appendix.

pulse has thus been given to the art of design, as applied to this article of commerce; and at the present day some of the most eminent Parisian decorators receive large salaries for devoting such a portion of their time as they can spare from their other avocations to the special service of the house for which they happen to be engaged.* There is no insuperable obstacle to our designing for ourselves; but the first and most important step towards enabling us to do so will be to rear a race of skilful decorative artists, and find for them a profitable employment. Indeed, so intimately is mural painting connected with design, as applied to manufactures generally, and more especially to the article under consideration, that I despair of our native designers ever being able to rival the French unless we can first obtain employment for them as decorative painters.

But decorative painting does more than assist in teaching the arts of design. House decoration is a book open to all, where all may read and learn a lesson. By improving the style of fitting up our dwellings, we shall thus, in adding to our own comfort and enjoyment, assist most effectually in spreading the principles of taste throughout the community. We know not how many men have lived and died with their genius undeveloped for want of a congenial atmosphere. Rear a child amidst a society of persons devoted to the practice of music, and dormant faculties will be awakened in his mind which might otherwise have slept for ever. Let us multiply objects of beauty, a new *atmosphere* will be created around us, and the taste of the community will in the same degree be purified and exalted. We must, as Plato says, 'seek for such 'workmen as are able, by the help of a good natural genius, 'to investigate the nature of the beautiful, that our youth, 'dwelling, as it were, in a healthy place, may be profited on

* See Plates V. VI. and VII.

'all sides, where, from the beautiful works, something will
'be conveyed to the sight and hearing, as a breeze bringeth
'health from salutary places.'

To find a Scottish answer to the first of two questions which we propose to consider in connexion with our subject, viz., Why are the paper-hangings of France and the mural decorations of the Continent generally superior to those of our own country? would not be a difficult matter. It would only be necessary to ask in reply,—To what cause should we ascribe the differences, physical and mental, which are found to exist between the various races of mankind? What are the circumstances which have contributed to form one race of men with high cheek bones, blue eyes, and fair complexions, and another with oval countenances, swarthy skins, and eyes of jet? Why is one race characterized by prudence and perseverance, a second by laziness and pride, and a third by excessive vanity, love of display, and exquisite taste. In answering such questions as these, we should doubtless make some progress towards solving the problem before us. For, notwithstanding the mixture of races and of tongues that has been effected in Europe by the complete or partial migrations of different tribes, by the devastating inroads of savage hordes, or the systematic wars and conquests of civilized nations, there still exist marked characteristics, both mental and physical, which broadly distinguish communities from each other, and which are exemplified in all their habits and productions.

The full consideration of this topic would lead us far from the end we propose to ourselves. To trace the influence of organization, of geographical position, or of the laws by which the internal economy of a country may have been regulated, in moulding the national character, and directing the energies

of a people, belongs not to such an essay as this, but to a disquisition on the philosophy of history. It is sufficient for our purpose to ascertain that these peculiarities exist. The natives of the south are a lively, versatile race, extremely susceptible of all impressions. Their minds partake of the brilliancy of their climate, and are rich with sparkling thoughts and beautiful imagery. The northern nations present a complete contrast to this picture. With greater depth of reasoning powers, and superior solidity of judgment—with more earnestness and perseverance—they are in a great measure destitute of that sportive and creative brilliancy which hangs like a rainbow over the genius of the south, and arrays them in a perpetual sunshine of delight.

The truth of these remarks, familiar if not commonplace in themselves, is strikingly illustrated in the case of France as contrasted with that of our own country. We here find the predominance of fancy and invention on the one hand, and of judgment on the other, distinctly marked; while this obvious explanation at the sametime touches a key-note with which not only the love of embellishment, but all the other national characteristics, will be found to be in perfect unison. Thus the vanity and love of display which distinguish the one nation, and which have more affinity with taste and fancy than with the judgment or the reasoning faculties, would lead naturally to the cultivation of those arts which minister most directly to their gratification; while the more purely reflective spirit of the other would grasp the substance, and disregard what seemed to be the shadow. Again, in England the tendency of the public mind is averse to change; while 'France,' it is Guizot, I think, who remarks, 'has hitherto 'been a great crucible, in which to try experiments for the 'regeneration of mankind.' Now, excellence in the arts of design, as applied to manufactures and to mural decoration,

depends essentially on the love of change and variety; for it is this which stimulates, by its constant demands, the inventive powers of the artist; and this disposition our volatile neighbours display not less strongly in the comparatively unimportant matters of dress and decoration than in affairs of greater moment. In the common affairs of every-day life the same national peculiarities exhibit themselves so strongly as to have passed into a proverb. Not a week elapses without bringing to our ears from the other side of the Channel some romantic story from real life, differing so much from what is every day happening amongst ourselves, that, in default of any other terms by which such incidents can be distinguished, we style them peculiarly French. Those familiar with the literature of the two countries find it impressed with the same distinctive features. One of the most pleasing and suggestive writers of modern times observes:—
'The literature of France is peculiarly rich in the poetry of
'the olden time. We can trace up the stream of song until
'it is lost in the deepening shadows of the Middle Ages.
'Even then it is not a shallow tinkling rill, but it comes like
'a mountain stream, gushing and sounding onward through
'the enchanted regions of romance, and mingles its voice
'with the trampling of steeds and the brazen sound of
'arms.'

It is obvious, then, that the greater enthusiasm and success with which the decorative arts have been cultivated by the French and other continental nations is *to some extent* a result of the peculiar genius of the people. We could not, in considering the question, have omitted all allusion to this topic, although the influence which we ascribe to such a circumstance arises mainly from accidental causes, and not altogether from the generic character of the races among which they have been at work. That one race

should have attained to high eminence in decorative art, and that another should have brought the science of politics to perfection, is due rather to the accidental course which the history of the nation has taken, to some chance obstructions which, at an early period in its history, prevented the stream from flowing in one direction, and to some guiding power which led it into another channel. The reaction of institutions upon the habits of thinking and the pursuits of a people is not less strongly marked than the original impress which the institutions themselves received from the character of their framers. But whatever opinion may be held on this point,—to whatever cause it may be owing that the French have addressed themselves to the decorative arts,—the fact is undoubted that these have engrossed the energies of the people for a period of not less than 300 years, a practical reason sufficient of itself to account for the position which they hold in France at the present day. Great efforts have *of late* been made in our own country to advance the arts of design. But we know that we cannot divert a mighty river from its course, although, at the fountainhead, a child might have turned the stream towards the opposite point of the compass. Neither can the talents and energies of a nation be easily turned aside from the channel in which they have flowed for centuries, although, at the time of emerging from barbarism, before the course was worn too deep, or the current had become too strong, they might have been made to flow in any direction. We cannot transplant the full-grown tree; it sickens and dies if removed from the spot where it attained maturity. It is always difficult, often impossible, to change the seat of the simplest manufacture. If I am correct, then, in stating that we are comparative novices in decorative art, we need not be surprised or disappointed to find that, notwithstanding all the recent efforts

made to effect *a revolution*, we are still excelled in one or more branches by some of the continental nations.

The decorative arts cannot with us start at once into a healthy, a matured existence. We may receive a lesson, and perhaps a warning, when we consider the results achieved by our neighbours, when, without a preparatory course of training, they attempted to occupy the province which we have appropriated, and essay their powers in politics,—for what comparison do their institutions bear to ours? Those of our own country are like the native oak—the growth of a thousand years—its roots spread far and wide, and deeply sunk in the affections of the people, who enjoy beneath its shade protection at once from the withering blight of despotic power, and the destructive blasts of democratic violence. The other is the gourd—the growth of a night—reared in the hot-bed of revolution, and destined to be overturned by the first storm which passes over the political horizon.

But although the decorative arts occupied the attention of some of the continental nations at a very early period in their history, no eminence could ever have been attained had the practice of them been entrusted to men of inferior abilities or imperfect education. In the infancy of the Fine Arts, every painter was a decorator, and men of the highest talents and standing were thus frequently engaged on works which would in our own country be considered degrading by any one who styled himself an artist. Hence, in those countries where these arts had their birth and earliest development, a close connexion subsisted, and to some extent still subsists, between the art of decoration and art in its highest branches. Painting was, however, comparatively unknown in our own country till in other lands it had attained maturity, and when it found a place among our fore-

fathers, it was introduced with all the distinctions which later times had established—distinctions which have since, with few exceptions, been rigidly maintained. Decorative painting has thus in our own country been always connected with mechanical house painting, and has no doubt been degraded by the association; while on the Continent, from an alliance of a different kind, it has succeeded to a portion of the dignity which belongs to high art.

But various causes of a practical nature have combined to place the decorative arts in the position which they occupy in France, and, among these, one of the most important is the munificent patronage with which they have always been favoured by the French monarchs and by the nobility.

Endowed as the French sovereigns were with absolute power, there existed no bounds to the gratification of their tastes in whatever mode they might choose to indulge them. The nobles lived but in the atmosphere of the Court, satellites, whose minds and manners reflected only those of that star of monarchy around whom they were perpetually revolving. Their mansions were fitted up with a splendour which often rivalled and sometimes eclipsed that of their masters.

The extravagant expenditure of Francis the First contributed, of itself, in no small degree, towards creating and fostering a taste for the arts. The glories of the Louvre and of Fontainbleau still attest the magnificence of his reign. The decorations of St Germain afforded employment to the most eminent artists of the age—the Château of Muette —the hunting seat of Chalnau—the graceful Pavilion of Follembray—the magnificent palace of Chambord—the Château of Madrid and Villars-Coteret, were erected and embellished to gratify his own taste for display, or to please the reigning favourites. The constant wars which devastated the Italian cities during the sixteenth century

drove many artists from their homes, whom the munificent patronage of the gay monarch induced to settle at his Court. The works of Rosso, Benvenuto Cellini, Primaticcio, and others, contributed to diffuse among the comparatively barbarous French the knowledge of art, while the crowd of capitalists, merchants, and craftsmen who accompanied them to France, by exercising in their adopted country the talents and knowledge which they possessed, assisted in imparting to its manufactures, and to the arts of design generally, the excellence which they have ever since possessed. At the period referred to the same individual frequently professed both painting and architecture ; and, accordingly, during the reign of Francis, mural decoration received its due share of attention, and a style of internal embellishment which bears his name, and has descended to us, is not surpassed by any specimens of the same art which have been produced in ancient or modern times.

Nor were the successors of Francis less liberal in their expenditure on works of art, when freedom from foreign wars or intestine broils left them untrammelled in the gratification of their tastes. In the reign of Louis Quatorze, and under the administration of the famous Colbert, the Gobelins became government property, the manufactury at Sevres was established, the Academy of Architecture was instituted, and the palaces of Versailles, le Grand Trianon, le Petit Trianon, Vincennes, and Marly were built and embellished. I am not aware that any architect in our country has ever been ennobled, but the architect and landscape gardener of Louis XIV. was a nobleman, who received his patent and the cross of St Lazarus as a reward for eminence in his profession. The debased Fouquet, no less than the enlightened Colbert, advanced the same cause—the latter by a course of liberal as well as judicious patronage, the former by the expenditure of his ill-

gotten wealth ; while the jealousy created in the mind of the monarch by the magnificence of the château which he had built at Vaux Praslin led to the erection of Versailles.

It is impossible, in considering this question, to over-rate the obligations under which France lies to Italy. It was in the latter country that the arts attained their earliest and perfect maturity. The proximity of the two countries, the sovereignty claimed by the French monarchs over several of the Italian states, and their frequent marriages with Italian princesses, brought about an intercourse between the nations, most favourable to the cultivation of art in France. To Italy the French are in a great measure indebted for their knowledge of painting, sculpture, and architecture ; and the character of the decorations prevailing at the time now referred to has been stamped on all their subsequent productions. The decorations of Francis the First, Louis XIV. and XV., are only modifications of the *Renaissance*—a style which prevails in all the art productions of France even to the present day.

Another and important cause of the superiority of continental decorators will be found in the domestic habits of the people.

The German of the middle class drinks his beer, and the Frenchman his *eau sucrèe* in the café, where their leisure hours seem chiefly to be spent ; while the Englishman finds his pleasure at his own hearth, in the society of his domestic circle. At first sight it might appear that this difference of habit should have produced a result exactly the reverse of that which we ascribe to it, and that all the efforts of our countryman would have been exerted to render his abode a retreat of elegance and refinement. Within certain limits this is the case. In point of substantial comfort the dwellings of the middle classes in England are superior in many respects to those of any in Europe. This superiority arises

in a great measure from the simple fact, that no other country contains a wealthy middle class like our own, while the love of comfort by which they are distinguished—a word unknown to either the French or the German language—impels them to devise all possible means for its attainment. But decorative painting of a high character has always been too expensive to admit of its general adoption among the middle ranks in any community, and what each individual cannot amongst ourselves do for the place where his time is chiefly spent, is, on the Continent, effected by combination. The decorations of the cafés, concert-rooms, theatres, &c., throughout France and Germany supplies an amount of work sufficient to keep a multitude of artists in constant employment.

But what renders the contrast between the position of decorative painting in the two countries the more obvious is the fact, that even in the houses of our wealthy countrymen—where saving of expenditure is no object, where there are extravagant mirrors, gorgeous hangings and carpets, rich carving, and masses of gilding—decorative painting, in the proper sense of the term, seldom finds a place.

It is in the mansions of the wealthy that the exquisite taste of the French, as decorators, exhibits itself to greatest advantage, and sums are lavished in embellishing the ceilings and walls of apartments which would surprise not a little those who are accustomed to the outlay necessary for the comparatively plain style in which these details of our apartments are generally finished.*

The demand created by the ritual of the Roman Catholic religion has also contributed powerfully to the promotion of decorative art among the continental nations. When we come to answer the second of the two questions which we purpose to submit for consideration, viz., What can

* See Plate VIII.

architects do for the advancement of mural decoration? it is not our intention to propose, as may be inferred from the introduction to the present chapter, that they should convert us all to Romanism as the initiatory step. We do not, in these modern days, think it necessary to burn down a dwelling-house when we desire to indulge in the luxury of roast pig; although, according to that distinguished historian who composed the essays of Elia, *crackling* was first discovered through an accidental conflagration; and in its earlier annals, each savoury grunter was cooked at a similar sacrifice. That celestial Soyer who first prepared the unctuous dainty by means of a kitchen fire and a spit established the startling position that crackling was not a necessary result of fire raising, but had only been one of its accidental accompaniments. It may be argued, and not without reason, that the Roman Catholic religion stands in the same relation to decorative painting. We are thus saved the painful necessity of recommending for its advancement the use of means which might startle some of the sterner disciples of Knox and Calvin, and provoke the assertion that we should thus be parting with our judgment to improve our taste. This is not the time or place to discuss the question whether painted decorations are admissible in churches. The genius of Protestantism repudiates them. Our religion teaches us that the sacrifice of a broken spirit alone is acceptable to the true object of worship. This doctrine, which seems to us to be lost sight of or concealed amid the splendid mysteries of the Romish ritual, has taught us to resent as idolatrous the kindling of any other '*lamp of sacrifice*,' and has perhaps reduced the decoration of our Presbyterian churches to a style of baldness and severity which the spirit of the passage does not necessarily inculcate. The amount and the kind of decoration admissible in churches may remain for decision

*as a question of taste* and of feeling—a question of course which will be determined by individuals according as they may deem it justifiable in the conduct of divine worship to influence the heart through the medium of the senses.

But I would shrink from the appearance of attempting to extinguish, or even to obscure, the lamp of sacrifice which the author of Modern Painters has kindled. The spirit which feeds it is the same as that commended in the sacred volume, and the light it sheds is so pure and holy that the attempt might almost be condemned as sacrilegious. Rather with him would I fan the flame, and sympathize with that feeling which for ecclesiastical structures 'offers precious things, not as being necessary to the 'building, but as an offering, surrendering, and sacrifice 'of what is to ourselves desirable.' The arts are said to be the handmaids of religion; as such they shine with borrowed lustre, and their dignity will precisely coincide with that of the object to which they are consecrated. The influence of religion, whether true or false, in fostering and cherishing all the arts which have been engaged in her service, is of an important character. To devotional feeling are due at once the architecture and sculpture of Greece, the painting of Italy, the frescoes of modern times, and last, not least, those glorious Gothic piles, erected during the night of the Dark Ages, and which embodied the genius of the times in far greater perfection than any production in the sister arts. If, then, mere decorative painting, as usually distinguished from high art, had been called on to contribute its aid to the public service of religion, we might have expected it to attain to a dignity and importance which it could not otherwise reach. And this supposition we find verified in the decorations of the churches of France and Germany, which afford a vast amount of beneficial and elevating employment, while the

exhibition of the works themselves tends to diffuse a love of art, and a knowledge of its true principles among the great mass of the community.

Much has doubtless been done for the arts of design in France by industrial expositions. These have been held periodically ever since 1799, and have produced a wholesome emulation among designers as well as manufacturers, who, by comparing their goods with those of their competitors, have been enabled to excel their previous achievements. Exhibitions have thus tended to promote an onward progress, each step being only the prelude to another in the same direction.

Great, and it is to be feared extravagant expectations have been formed of the results to be effected by the Schools of Design now established throughout the country. Far be it from us to undervalue their importance. They are now as essential to our success as the learning of the alphabet to a man who would become a scholar; and I am convinced that, conducted as these schools now are, their influence will soon become manifest in all the art productions of our country. But these schools are not all, nor even the principal part of what was wanted. Such an idea would not be more reasonable than the supposition that every man must become a scholar who had gone through the initiatory process. France was great in decorative art before she possessed any Schools of Design, except those which were furnished by the studios and workshops of her artists. We cannot then hope that we shall, by such schools alone, be enabled to rival nations possessed of machinery more complete in this department than our own. Drawing forms a regular branch of education even in the elementary schools of the Continent, while, in other respects, the decorative artists of foreign countries possess many advantages of a still more important kind.

We have thus mentioned a few of the causes which ap-

pear to have operated in producing the state of matters which has been under consideration. It will have been observed, however, that these causes are all of an intermediate character, and mainly beyond our reach. But they all merge into one grand practical cause, to which we must address ourselves, and that is simply a want of demand for the article.

This want of demand exhibits its influence in many ways. Its immediate consequence is, that there are few, if any, operatives of talent in the profession. But, indeed, we err in calling the decorative art a profession, for in this country, as has already been stated, it has no existence separate and distinct from that of the mechanical house painter. There is thus, with us, no proper system of education for decorative artists. Any man who attains to such an amount of skill as to entitle him to the appellation, must be possessed of no ordinary amount of talent and perseverance. He must, in fact, rise from the rank of a common mechanic; and the marvel is, not that so few, but that so many have done so. At the same time, how small a number even of those who have thus distinguished themselves has house decoration retained in its service. No sooner does a workman obtain a certain command of his pencil than he abandons his own profession, and betakes himself to one which is held to be more honourable, and which he hopes to find more lucrative. The humble trade of house painting has, in this way, contributed many volunteers to the array of artists who have conferred lustre on their adopted profession, and gained no small renown for themselves. The memory of every one will supply him with cases in point. But I may mention, in connexion with the city of Edinburgh alone, the names of Roberts, whose illustrations of eastern subjects have secured for him a European reputation; of Stanfield, Ewbank, John Wilson, Kidd, Gibb, Fenwick, Robert Cooper, William

Mason, besides whom there are many of equal standing. We do not argue that it would have been better on the whole if these men had continued members of the profession to which they originally belonged. We simply state a fact. Had that profession afforded them a congenial and remunerative occupation, it is probable, if not certain, that they would not have deserted it, and doubtless their support would have conferred upon it a vast accession of dignity and importance. A school comprising such men as those I have named would have acknowledged no superior in Europe.

But not only does the want of demand affect the art of design ;—its influence extends even to the *cost of execution*, and to the *finish of the details*. That must always be costly which there are few prepared to execute ; and the cost must be much enhanced if, as in the present instance, these few are men possessed of sufficient talents to have rendered them good decorative painters in spite of the difficulties which they must have encountered in the acquisition of their art. A greater amount of public patronage will produce its natural consequences. The business will become more a mechanical trade, in which any one of ordinary abilities may attain a certain proficiency, or at least may master certain details. A division of labour will eventually come to be established in our own country, as in Paris, where one man paints the fruit, flowers, and raffaelesque ornaments ; another the landscapes ; a third the figures, ornaments *en grisaille*, &c. ; a fourth the cameos, which form so prominent a feature in modern French decoration ; and so on throughout all the range of decorative painting. And by such means will the cost be reduced, so as to bring good decorative painting within the reach of the masses, while in design and detail everything will be perfect in its kind.

To the second of the two questions which I have to sub-

mit for consideration, viz. What can architects do for the advancement of decorative painting? the answer then becomes sufficiently obvious.

They can create that demand which is the great desideratum, and they can guide the current of public taste in the right direction.

After the statement which has been made in regard to the superior advantages possessed by foreign countries, it may be thought that it will not be an easy matter to create a demand sufficient for the purpose in view. But the difficulties are not insurmountable. We have within ourselves most ample means: wealth such as no other country can boast of, and abundance of talent. In high art we own no superiors. No country but our own has produced throughout the entire course of its annals such an amount and variety of talent as that exemplified by the names, Hogarth, Reynolds, Turner, Wilkie, Dyce, Maclise, Etty, and Landseer, while even in Rome an Englishman resident there is acknowledged to be the first sculptor of the age. It may be that, from temperament or training, we turn towards one class of pursuits more naturally than towards another, but let the energies of our people be once aroused, and directed towards the object in view, and difficulties will vanish. Let, then, a demand for the article be created, and a supply will be found equal to aught that France, Germany, or Italy can produce; and, as a sequel, when we possess a race of native decorators equal in inventive power to the French, and in mechanical skill to the German, we shall hear no complaints of an inferiority in the designs for our manufactured goods.

The first and most obvious practical step which architects can take towards producing the requisite demand, is to make arrangements for Decorative Painting in the original design of the building. And in the very act of thus creating a demand they will make provision for the performance of the

other duty which we require of them,—the guiding of the public taste in the right direction.

Among our continental neighbours, wherever Decorative Painting is intended to be introduced, it forms an integral part of the plan. It is thus arranged by the architect, who undertakes the responsibility and superintendence of the execution. He is by these means enabled to assign to each detail its true position and office. Incongruities are thus avoided. Sculpture, painting, and upholstery are kept in their proper places, and no one of them allowed to obtrude itself to the destruction of the general harmony. The necessity of such a controlling power is obvious from the partiality which every man feels for his own art, and the risk of his giving undue prominence to its productions. I shall not be guilty of the presumption of saying what should be the nature and amount of an architect's acquirements. We are all acquainted with the curriculum which Vitruvius chalks out for him. Plato says somewhere that a good architect is worth a talent per day; and if Vitruvius be correct, the great philosopher's estimate is sufficiently moderate. But if our thesis can be maintained, a certain knowledge of the application and capabilities of Decorative Painting would form a necessary part of his education. In the case of Decorative Painting coming into extensive use, supervision of the architect would be indispensable. Even as the case now stands, the sins daily committed against good taste are so numerous and so aggravated as to call loudly for the exercise, on the part of the architect, of that influence which is at once his duty and his right.

It is unnecessary in such a paper as this to enter on a minute exposition of the details of decoration. But there are certain points connected both with general arrangement and with detail, regarding which I shall offer a few suggestions.

The first of these refers to a very familiar matter, but one of great importance in the arrangements for Decorative Painting, that is, the necessity of a symmetrical disposition of the parts. It often creates a difficulty that a patera does not occupy the centre of a ceiling; that a mantelpiece is not placed in the middle of a wall; that a door is not balanced by another in a similar position; that the spaces between windows are not alike, without any apparent reason for departing from a regular arrangement. When a ceiling or a wall is finished in a plain uniform colour, these discrepancies are not so much remarked, but if the room is divided into compartments, and the spaces filled in with ornament, the effect is frequently most offensive.

But there is more required than mere symmetrical arrangement. It is not an easy matter to make Mural Painting effective where the wall is altogether flat. Accordingly, wherever it is possible, painting should be mixed up with raised ornament, care being taken to distribute the details of each so as to assist and heighten the effect of the other. The character of the decoration being resolved on, the room should be panneled in accordance with it, and so arranged that the painting may appear to be, not a mere accident, but an integral part of the design. It is not proposed to subject mere internal decoration to the same stringent rules as sculpture and architecture. A certain harmony of parts is, however, required, arising either from a feeling of inherent fitness existing between various forms, or from arbitrary associations, which are equally entitled to respect. By the method which we propose, the painting is provided with a frame, without which, indeed, *no* painting can ever appear to advantage; while the use of the panneling, comparatively ineffective and unmeaning of itself, is at once rendered obvious and apparent. The composition mouldings and ornaments now so extensively used in Lon-

don afford a cheap and expeditious method of effecting our object. Of these composition ornaments many very beautiful specimens were to be seen in the Great Exhibition. They can be painted as soon as they are fixed on the walls, and they are not liable to be chipped or broken, an objection fatal to the use of stucco enrichments, in any position where they are exposed to damage from the furniture.

In all combinations, however, of sculpture and painting, colour should ever be kept subordinate to form. It is a menial, and should never be allowed to obtrude itself, or to occupy the principal place. The necessity of attention to this principle is felt more particularly in our public buildings, or in such erections as pretend to architectural effect. I have no patience with the impertinence of that painting which is always crying, 'Look at me, and don't mind the Architecture.' If any one doubts the truth of this position, he may verify it by experiment. Carve a piece of dark variegated marble into the form of a statue,—a richly ornamented chimney-piece, or even a fluted column: the material is destroyed, and the labour is lost: an injustice is done to the carving as well as to the marble. Though executed by the hand of a Phidias, it could possess none of the play of light and shade which forms the chief inherent beauty of sculpture, while the rich colouring and delicate veining of the marble is never seen to advantage except on a plain surface. You may by such means obtain richness of effect, but it must ever be at the expense of chasteness. The truth, however, of this principle—the subordination of colour to form—does not rest on a mere illustration. It is founded on the very nature of our mental constitution. Beauty of form is discerned by the intellect alone, while that of colour is based on sensual gratification—a pleasure mixed up in no small amount with the enjoyment which it affords. Hence the result: every man of cultivated taste instinctively resents the removal of an intellectual appliance, and the sub-

stitution in its place of that which merely gratifies the sense.

But coloured decorations should not be used in all positions. Ruskin enounces a principle:—'Wherever you can 'rest, there decorate.' The discussion of this subject in all its details would lead us into a wide field, but it suggests a negative proposition which will meet with general concurrence. All coloured decoration, at least all embellishment of that class which does not come within the domain of high art, should be banished from places of public business. High art, it may be argued, can never be out of place; but decoration proper—at all events as the art is now practised—is a mere luxury to be enjoyed in our hours of leisure. It should therefore be confined to our boudoirs, drawing-rooms, or other places and apartments where those hours are passed.

A lavish use of coloured decoration is, however, in all circumstances, to be condemned. A little bit of well executed work affords an agreeable relief to the eye,—a mass of it produces a surfeit. No cook could ever please the palates of his customers by serving them constantly with plum pudding; neither will a reasonable decorator cover the whole surface of a wall with coloured enrichment. The application of this principle leads to the condemnation of a style which has prevailed of late years in Munich, and which has to some extent been introduced into our own country. It covers every square inch of flat surface with bright coloured ornaments, daubs the mouldings, and picks in the plaster enrichments with the primary colours. Such a style may be exemplified with the strictest attention to theory. The utmost regard may be paid to arrangement and to the received laws of harmony. The impression which it leaves is one of dissatisfaction. The eye can find no pleasure in its contemplation, but, wearied, seeks in vain for some quiet spot on which to rest in peace. The use of the primary

colours in masses which distinguishes this style of decoration is another fatal error. Although nature and art are used as opposing terms, the latter must ever adopt the former as her guide. Our valleys are not vermilion, and our mountains rejoice without being clad in a chrome colour. We should follow nature's example, and use those two primaries with a sparing hand, and if blue must be introduced in quantity, let it be the blue of the sky, and not ultramarine.

These general remarks—offered as suggestions merely—are intended to apply to all decoration, in whatever position it may be used. But to descend somewhat more to details. As to ceilings, the general custom with us has been to lay them over with a coat of whitewash, or a pale colour of some kind. The propriety of this method of finishing admits of question. The ceiling is peculiarly adapted for receiving embellishment. It does not obtrude itself as a wall may, when one is not in a mood for studying decoration, while the whole of it can be seen at a glance. The ceiling is never wanted as a surface against which to hang framed pictures, and no part of it is ever concealed from the eye by furniture. Artists cannot urge the same objection to painted decoration in such a position which I have heard them state against its being used on walls, viz., that it destroys the back-ground for the figures in the room. The Parisians are in the habit of ornamenting ceilings with groups of flowers, figures, and borders, executed in paper-hangings. Some of these are exceedingly beautiful, and the cost is, of course, considerably less than that of painting. Care must be taken in this, as in all decoration, that it be in harmony with the character of the building, and the use to which the apartment is applied. As a rule in private dwellings, ceiling embellishments should be light, depending for their effect more on outline than on the finish of the details. The most peculiar ceiling which has come under my observation is one in the house which was prepared

for Lola Montes in Munich, and which is composed entirely of mirrors. It is unnecessary to animadvert upon such a style of ceiling decoration, which is, to say the least of it, of a somewhat perplexing character, confounding in a most extraordinary manner the distinction between head and heels, and creating an utter obliviousness as to 'which of the two 'is not the other.' In an apartment so decorated, one feels as if he were in the position which Byron so graphically describes, when he says—

> 'I wish that I were as much clay
> As I am blood, bones, marrow, passion, feeling,
> And then the past would all be past away:
> As for the future—but I write this reeling,
> Having got drunk exceedingly to-day,
> So that I seem to stand upon the ceiling.'

There is no decoration more effective than plate glass, but it will be conceded that the ceiling is not its most appropriate position.

In regard to cornices—although, as generally constructed amongst ourselves, they afford no scope to the decorative painter in the exercise of his art—they are perhaps the most difficult part of a room to manage. They are generally heavy masses of plaster work, unsuited to the height or character of the apartment to which they belong, and apparently more calculated to draw down the ceiling than afford to it that support which I believe it is their primary object to give. In style of colour and finish, the cornice should have more in common with the wall, to which it properly belongs, than with the roof which it supports. But where the wall is painted of a dark colour, and the cornice made to match it, the whole effect of light and shade, and even the form of its enrichments, is lost. Where the walls are papered, it is always difficult, often impossible, to make such an arrangement for an enrichment of this nature as will sustain its character and

keep up the connexion between the different details; while, if it is taken in with the ceiling, its object as a support is concealed, and the height of the room is materially lessened.

The cornices most generally made use of in houses of any pretension are Corinthian, transplanted without much if any change from the entablature of a portico. Where this style is carried throughout an apartment, it is no doubt quite appropriate for internal decoration. But the interiors of few dwelling-houses possess any marked architectural features, and far less have they anything in common with the style to which these enrichments belong. This fact alone suggests an inquiry whether some more appropriate kind of crowning enrichment might not be introduced. The Corinthian cornice is a detail exquisitely adapted to the entablature, of which it forms so distinguished a member, and of itself must command admiration in any position. But ought we not to forbid the divorce which, without process of law or reason, separates members which have for thousands of years existed happily in union, and which prostitutes them to purposes for which they were never intended by their inventors. Might not a cove, with a simple moulding or enrichment, be occasionally used? It would in all cases be more manageable, for it would impose no difficulties in the way of keeping up a proper connexion between the ceiling and the walls, and, if properly painted, it would in most cases be equally effective.* Or might not a modification of the cornices peculiar to the *renaissance*, or some of the French styles, be introduced? I have expressed an opinion that the best decoration is to be obtained by a combination of painting and ornaments in relief. The character of cornice referred to admits the fulfilment of this condition; for while the trusses will be arranged to suit the symmetry of the pannels below, the spaces between may be most effectively filled in with coloured ornament. Besides

* See Plate II.

this advantage, the styles themselves, from their greater plasticity, are perhaps in this respect better adapted for internal decoration than any of the severer orders, or than any style which renders it necessary to preserve a straight unbroken line of cornice round the room.

The wall is obviously the principal feature in an apartment. It presents the largest surface to the eye, and meets it more frequently than either the ceiling or the floor. The style of finishing it should therefore be resolved on as the primary and most important step, lest it should be sacrificed to some of the subordinate details. Flat walls are of comparatively modern date, and were introduced, it is presumed, as an improvement on panneling. Perhaps there was reason for viewing them in this light, when no enrichments could be obtained at a cheap rate, except such as were executed in stucco. But it may be doubted whether the old method ought not to be more frequently resorted to, since we have now within our reach a material for wall enrichments combining the three important elements of elegance, cheapness, and durability.

The floor I hold to be next in importance to the wall. It occupies the same space as the ceiling, but it meets the eye more frequently. The carpets at present in vogue are highly creditable to our designers as works of art, and exquisitely beautiful as productions of the loom, but extravagantly absurd when considered with reference to the purpose to which they are applied. The fashionable patterns consist of huge scrolls in imitation of carved work, on which, if real, it would be impossible to walk; large groups and wreaths of flowers, which could have flourished only in the gardens of Brobdignag; balconies, with staircases and other architectural adjuncts; landscapes, waterfalls, and objects of a similar kind; while a full-sized lion or tiger is used occasionally to guard the domestic hearth. These are all very good subjects for pictures, but not for carpets. Floors are for walking on, and

good taste forbids our placing upon them any object, or a representation of any object which if real would render the performance of that operation uncomfortable or dangerous. Pictures are highly commendable, but they should not be used to cover up floors. Neither should they be walked upon, nor put in positions where they must *of necessity* be concealed from the view by furniture. If flowers must be used on the floor, they should either be confined to a border or scattered over the surface, as it were, with a careless hand, and not painfully twisted in huge wreaths round scrolls and trellice-work. The best carpet designs, however, consist of conventional forms merely, without any direct imitation of nature. This rule applies equally to paper-hangings, where they are intended to be used as a uniform covering for a wall. It is a mistake in any case to overlay a large space with a repetition of masses of flowers or obtrusive scroll-work. The tone of colour used in carpets should always be subdued, for these two reasons, *First*, The floor alone receives the light direct from the sky, and colours placed on it seem much brighter than when on the walls and ceiling ; and *secondly*, Worsted admits of a brilliancy of colour which no painting can equal. The colours which are now generally placed on the floors render it almost impossible to make a harmonious arrangement by the use of positive colour on the walls. The decorator is thus frequently precluded from using any other than neutral tints, thereby sacrificing the more dignified portions of our apartments to the less worthy. Having long advocated the necessity of a change in the style of carpets, I rejoice to find the views which I entertain most ably supported in the Prize Essay published in the Art Journal on the Great Exhibition, considered as a lesson in taste, and which I do not doubt is in the hands of most of the members of the Institute.

The methods of painting wood-work in plain colours, or

in white hatched with gold, are too well known to require notice. But gilded ornament on the pannels, picked in with the wall colours, or even small landscapes and figures, or groups of flowers, may be introduced with excellent effect.

It has been more common, however, with us to paint the joiner work in imitation of some fancy wood, and to this art, and that of imitating marbles, the chief attention of our decorators has been directed. Great success has attended their efforts, and in the late Industrial Exhibition specimens were to be seen which actually excelled the reality. But a notion has sprung up of late years that all attempts at imitating material are to be condemned as æsthetical falsehoods. It becomes, therefore, a matter of some importance to ascertain whether a practice which prevails so generally is founded on a false principle, and this discussion occurs appropriately in its present position, as connected with the style of finishing the wood-work of our apartments. The question is treated fully in the very original and deeply interesting treatise on architecture by E. L. Garbett, who condemns the practice; and the highly gifted author of the Seven Lamps of Architecture throws his authority into the same scale.

'Touching the false representation of material,' he says, in the truly admirable work referred to, 'the question is infinitely more simple, 'and the law more sweeping; all such imitations are utterly base and 'inadmissible. It is melancholy to think of the time and expense lost 'in marbling the shop fronts of London alone, and of the waste of our 'resources in absolute vanities, in things about which no mortal cares, 'by which no eye is ever arrested, unless painfully, and which do not 'add one whit to comfort, or cleanliness, or even to that great object 'of commercial art—conspicuousness. But in architecture of a higher 'rank, how much more is it to be condemned. . . . I may perhaps 'be permitted,' he continues, 'while I express my sincere admiration of the 'very noble entrance and general architecture of the British Museum, to 'express also my regret that the noble granite foundation of the stair-'case should be mocked at its landing by an imitation, the more blame-

'able because tolerably successful. The only effect of it is to cast a 'suspicion upon the true stones below, and upon every bit of granite 'afterwards encountered.'

And again, at another part of the same book:

'The worth of a diamond is simply the understanding of the time 'it must take to look for it before it is found. . . . . 'Exactly as a woman of feeling would not wear false jewels, so would 'a builder of honour disdain false ornaments. The using of them is 'just as downright and inexcusable a lie. You use that which pretends 'to a worth which it has not; which pretends to have cost, and to be, 'what it did not, and is not; it is an imposition, a vulgarity, an imper-'tinence, and a sin. Down with it to the ground, grind it to powder, 'leave its ragged place upon the wall rather; you have not paid for it, 'you have no business with it, you do not want it. Nobody wants 'ornaments in this world, but everybody wants integrity. All the fair 'devices that ever were fancied, are not worth a lie. Leave your 'walls as bare as a planed board, or build them of baked mud and chop-'ped straw, if need be; but do not rough-cast them with falsehood.'

I cannot agree with those who think there is no force in these arguments. They seem to me not a little convincing, and coming to us with the sanction of Mr Ruskin's name, they would have been worthy of our best attention, although they had been possessed of no other claims. But I believe that they are fallacious notwithstanding.

It will be observed that the sin is held to lie in the *deception.* We shall not be suspected of an intention to argue that there is no harm in a moral deception, but it may perhaps be asked on what authority the principles of ethics are in this case applied to æsthetics. The principles of ethics are founded (leaving revelation out of view) on the primary convictions of mankind, and I am not aware that æsthetics can lay claim to any *higher* authority. The very fact, then, that these imitations are so generally practised, and so much admired among an educated people, certainly affords a presumption in their favour. But we shall pass from this point, and ascertain, as careful judges

ought to do, on what side the best precedents can be quoted Now, it is common in disputed questions of taste—which means, of course, in all questions of taste—to appeal to the authority of the ancient Greeks as the court of last resort, and I should be sorry to depart from a custom which, if not yet venerable from its antiquity, has at least the merit of being the fashion. And in appealing to them we may congratulate ourselves, and perhaps the *ancient* Greeks too, that they do not live in *modern* times, for one of two things must have been the result of such a misfortune ;—either we should have wanted a tribunal before which we could bring our cases for ultimate decision, or they must have had an accumulation of suits which would have left the Court of Chancery altogether destitute of a reputation.

Did the Greeks, then, allow the principle of deception in art ?

It is recorded of Zeuxis, one of the greatest painters of ancient times, that the birds came and pecked at the fruit on his canvass. Whether this story be more worthy of belief than that of Arion and his dolphins, we know not, but the fact of its being related sufficiently proves that the wonderful people whose support we claim were not less alive to the power of painting than of music, and that the deceptive character of the former was reckoned one of its chief merits. In a trial of skill between Zeuxis and Parrhasius, the victory was adjudged to the latter, when his opponent, entering his studio, desired him to withdraw the curtain, behind which he supposed his rival picture was concealed,—the curtain itself being the picture ; and Zeuxis gracefully acknowledged his defeat, saying his own picture had merely deceived birds, while the other had deceived men.

But we depend not on the support of the ancient Greeks alone. Mr Ruskin, and all the other writers on this subject, admit of veneering, both with wood and marble. Now it is

difficult to see how there can be more harm in making a wall look like solid marble by veneering it with paint, than by covering it with thin slices of the marble itself—the common method, when that material is actually made use of. It appears quite as justifiable to paint a door in imitation of maple or satin wood as to make a veneer of the same on fir.

But deception is allowed in many cases besides painting. The chief merit of novel writing and of acting consists in their deceptive character. It would be a new style of objection to the story of Robinson Crusoe that it was a gross deception—that no one could read such a work without feeling convinced that it narrated facts ; and to Macready's acting, that he appeared to be animated by the passions which his words expressed. It is difficult to see wherein these cases differ, so far as the deception is concerned, from that of imitative painting. The paintings on the ceilings of the Bourse in Paris, and many of the friezes in the Louvre, Versailles, &c., are drawn and painted with such exquisite nicety as to fulfil all the conditions required of the material represented. And probably these objects obtain greater admiration than would have been bestowed on sculpture itself, even as we should admire the man who could personify a passion, while we should disregard one actually under its influence.

But the novel writing, the dramatic representation, and the painting, only deceive those who have not knowledge or penetration enough to detect the imposition. In this case, indeed, if the deception is the crime, the balance of argument, according to the views of our opponents, is in our favour. The painting contains internal evidence to reveal its true nature, while the real character of the romance and the acting, if they at all fulfil the conditions required of them, must be ascertained from certain conventionalisms known only to the initiated, or from extraneous sources. But, indeed, al-

though imitations may occasionally deceive, they are not used for the purpose of deception. Deception may therefore in every case be altogether incapable of defence, and imitations of woods and marbles may be justifiable notwithstanding. Indeed, in the same chapter which contains their condemnation there are passages which seem directly to justify such of them as decorators are in the habit of using. 'Gilding,' Mr Ruskin says, 'has become, from its frequent use, innocent.' 'It 'is understood,' he says, 'for a film merely, and therefore is 'allowable to any extent.' I cannot admit the abstract justice of the doctrine contained in this passage, for it would go far towards justifying any practice, however absurd, which might happen to have the sanction of antiquity, and it is certainly altogether at variance with the principle on which imitations are condemned. According to this doctrine, gilding must at one time have been wrong. But that which is originally wrong can never be made right by repetition. On the contrary, it is common to hold that what is here admitted as an atonement for the offence serves as an aggravation of it. But in our view of the case we are at full liberty to take advantage of the statement, which—even granting, for argument's sake, that deceptions cannot be allowed—supplies us with an apology for imitating woods and marbles in all *legitimate* situations; for the use of them has been for a long period so common, and the real materials which are usually imitated so rare in internal fittings, that they will seldom, if ever, pass for aught else than what they are.

Several causes combine to favour the use of imitations, which I shall mention in the order of their importance:—1*st.* Their beauty; 2*d.* Their durability; 3*d.* The dignity which they confer as objects of cost.

Their beauty arises from various sources. One of these—common to all works of art—is the rare talent and skill dis-

played in the execution, and which the practised eye at once detects. The second is an inherent beauty, and is due to the colour, shades, and veining, which, constituting the loveliness of the real object, are found only in a less degree beautiful in the representation ; while a third class of beauty may be discovered in the deceptive character objected to, and which, to use the words which Mr Ruskin employs in reference to another matter, forms a legitimate appeal to the imagination. The durability of imitations of woods and marbles forms a strong recommendation, for they are lasting beyond all other styles of painting. As objects of cost they are in themselves of no mean value, but the fact of their being executed in imitation of objects still more costly is never taken into consideration.

These reasons for the use of imitations seem of themselves sufficiently cogent, while their beauty we have traced to the identical sources from which the beauty of all works of art is *in some measure* derived. No doubt they are altogether wanting in beauty of the highest class, but that which they do possess is derived from sources which are quite legitimate. This explanation serves to expose the nature of the fallacy contained in the arguments against representations of material generally, and which would thus appear to consist in placing under the same category imitations of objects which are used *solely or chiefly on account of their beauty,* and those which are used *solely or chiefly on account of their suggesting ideas of cost.* A fancy wood is an example of the former, a precious stone of the latter. You may deceive by making an article which possesses very little real value resemble a costly one ; but to speak of deceiving as to beauty would be an absurdity. The appearance of cost and of value may exist without the reality, but the *appearance* of beauty and the *reality* are one and the same thing.

There are, however, several conditions, attention to which is imperative in the use of imitations, and, if these are observed, they may be resorted to without infringing the laws of good taste:

1*st.* That they be not employed where the material represented would of itself be out of place or inappropriate.

2*d.* That no object be painted in imitation of one material which, from its form, construction, or application, was obviously or necessarily composed of another.

3*d.* That no imitation be employed in positions where we are entitled to expect that the real material should be used, or where the discovery would create disappointment.*

In conclusion, why should not the principle of generalization common to all the arts be allowed to extend even to the humble one of imitating woods and marbles. A skilful imitator does not require to copy, and does not copy individuals merely; he may adopt the principle which Bacon lays down of copying all the best parts from various individuals, that he may make one the more excellent. And if we must admit the principles which govern the æsthetics of mere decoration to be as rigid and unyielding as those which fix the foundations of morals, we may still, taking another view of our subject, claim for imitative painting the same admiration that a skilful intellectual gladiator obtains, who, without any intention to deceive, or without being himself deceived, succeeds in making the worse appear to be the better reason.

* It will be observed that the application of these rules will exclude imitations in most of the positions in which Mr Ruskin objects to their being used.

# APPENDIX.

## DESCRIPTION OF THE ENGRAVINGS.

In selecting a few examples of decoration for the purpose of illustrating his paper, the author has been guided by a desire to render them interesting from their novelty. He has therefore avoided the more familiar forms, such as the Pompeiian, the various styles of the time of Louis XIV, &c. Any of these might have served the main purpose intended, but otherwise their reproduction would have been of no use, for they have been already published in many forms, and are at least well known, if not common-place.

### Plate I.

Is the design of a painted decoration executed for a hypæthral corridor. It was painted on canvass, and exhibited in the Crystal Palace before being fixed in the place it was destined to occupy. It is a composition of fragments, and is intended to illustrate the nature and amount of the acquirements necessary for a good decorative painter. Were such a decoration executed by one hand, and in the present instance it was so, the painter being a Frenchman in the employment of the firm of which the author is a member, he would require to paint the human figure, raffaelesque ornaments, ornaments in imitation of sculpture, of raised gold work, fruit, flowers, heraldry, &c. &c., and, added to this, he would require to possess the power of designing and adapting to a place already built without reference to any style of painting. The character of this decoration is strictly *renaissance.* The colours in the plate are not exactly the same as those used on the wall, but approach them as nearly perhaps as lithography would admit of.

### Plate II.

Exhibits a drawing-room decoration, in one of the most graceful of French styles, which is not at all known in this country. It belongs to the time of Louis XV., and is distinguished by the name of Pompadour.

It came into use somewhat later than the style of Watteau, to which, it will be observed, the details of ornament bear some resemblance. The enrichments, which in the engraving appear solid gilt, are in the work itself hatched upon a light gold colour. In execution, therefore, this decoration has a lightness and elegance of which the engraving scarcely conveys the idea.

This Plate exhibits something of the style of cornice referred to at p. 27 of this paper.

### Plate III.

Is an original design for a drawing-room, the style modern. Various modes of filling up the panels are given.

### Plate IV.

Is an original design for the ceiling and walls of a dining-room. The walls are intended to be covered with dark-green velvet paper-hanging.

### Plate V.

Is a new decoration in paper-hangings by Mader, Frères, in Paris. It is styled "Les Arts reunis." There are four landscapes of the same size as that in the centre compartment. The expense of getting up a decoration of this class is very great, varying from £1000 to £2000. This decoration obtained the second prize at the Great Exhibition. The colours of this decoration are not given, nor are the colours of those decorations of which Plates VI. VII. and VIII. are representations.

### Plate VI.

Shews the paper-hanging decoration by Delicour, "La Chasse," which obtained the Council Medal at the Great Exhibition.

### Plate VII.

A paper-hanging decoration by Delicour, of exquisite design and execution—"The Arts and Sciences." It obtained a gold medal in the French Exposition for 1844.

### Plate VIII.

Ground plan and elevation of a suite of apartments which the author saw in Paris. They consist of dining-room, drawing-room, and boudoir. The three rooms were connected by double doors, removable

at pleasure. Over the mantel-pieces of the dining-room and the boudoir were placed large mirrors. Between the drawing-room and boudoir, also between the drawing-room and dining-room, were large single panes of plate-glass, corresponding in shape to the mirrors. These could be closed with shutters when required. The mirrors being at the extreme ends, reflected each other and all the intervening objects in endless perspective, which in gas-light produced a most magical effect. The ground plan gives a correct representation of the arrangement, which affords a simple method of throwing three rooms into one, and again isolating them. In our own country it might not suit to have a dining-room one of three rooms so placed, but it seems a very suitable plan for library, drawing-room, and boudoir. The elevation will convey a faint notion of the decoration, which was exquisitely finished, the strictest regard having been paid to unity of design on ceiling and walls, as well as in the minutest article of furniture.

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## No. XI.

# ON THE MEANS FOR IMPROVING THE OLD LOCALITIES OF GLASGOW.

BY

DAVID SMITH, Esq., Architect.

[*Read at the Meeting of the Institute in Glasgow on 12th February* 1852.]

The state of our wynds and deep closes has long been a matter of serious concern to the philanthropists of this city. From the ignorance of our forefathers as to the circumstances necessary for the preservation of health, and from the excessive influx of masses of the lower Irish during the last forty years, the older parts of the city have been crammed with buildings, and over-crowded with inhabitants, to a most oppressive degree.

In an architectural as well as moral point of view, a survey of some of those ancient localities is highly interesting. On the east side of Saltmarket there are no less than eighteen closes, each about 400 feet long, and terminating at the burn, which is now covered over. In ancient times, I daresay, some of these residences were retired and rural. I have been told

that at the sale of some of the property in St Andrew's Lane for the opening of London Street, it was found that in the title-deeds of one of these tenements it was declared that they had a right to the fishing in the burn! Since we remember it, it has been famous for nothing but filth and rats, having become the receptacle of the drainage of the whole of the upper and central parts of the old town. While the middle and higher classes resided amongst, or in the vicinity of, the dwellings of the humbler classes, many of the evils of over-crowding were mitigated, and properties were kept in a better state of repair. But in our own time the separation of classes has become marked and general. Many houses which were formerly let to wealthy individuals occupying five or six apartments, have now the lobby-door thrown open, and every separate apartment turned into the dwelling-place of one or more families. Moreover, all the evils of absenteeism are here experienced, these properties being rarely visited by landlords.

On the west side of Saltmarket there are sixteen closes of the same character. The High Street presents the same appearance. On the east side, from the Cross to Duke Street, there are fourteen, and on the west side, from the Cross to George Street, there are seventeen closes. There are, besides these, three vennels or wynds on the east side, and one on the west side.

These closes range from 400 to 500 feet in length, and vary from 3 or 4 feet to 8 or 10 feet in width. The houses run in stripes at right angles from the front buildings, and are generally placed back to back. In most cases the buildings are only one room in breadth, and consequently there is very little thorough ventilation. In many of these closes from 200 to 600 inhabitants reside, in places where the direct rays of the sun seldom penetrate.

There are a good many houses in Gallowgate, Bridgegate, Gorbals, and the Wynds, built on the same pernicious plan. And it is to be regretted that even in newer localities the same evils are widely extending. It has been ascertained by eminent French physicians that the absence of light has fully as much of a deleterious influence on the health of infants as even the want of ventilation. Cutaneous and other dangerous diseases have been thereby greatly increased.

It may add to the interest of this paper that I give a short sketch of the various Acts of Parliament obtained for opening streets during the last sixty years.

In 1793 the Magistrates and Council obtained an act to rebuild the Tron Church, which had been burned, and to remove the Tron Steeple and adjoining buildings, which projected into the Trongate. In this act power is taken to purchase the Bowling Green in Candleriggs, and to erect thereon, if they see fit, the Tron Church; also to open a street through the Ravenshaw grounds to Buchanan Street; to purchase the grounds of Meadowflat; to make a street from or near a house called St Niedas Hospital, in Stable Green, Port Street, in a straight line westward till it crosses the line of John Street, and thence southward in a straight line till it joins that street; and to extend Brunswick Street southward to the Trongate, and northward to George Street. Power is also taken to sell a portion of the Calton Green, not exceeding 70 yards in breadth; to erect a stone bridge across Clyde at the foot of Saltmarket, and to widen and improve the lower part of that street as the Magistrates may see fit. The first notice of power to weigh coals is to be found in this act.

In 1806 an act was obtained for carrying Clyde Street eastward across the Stockwell to the Green of Glasgow, and

to remove the Slaughter House nearer to Bridgegate; also to form a new street, running southward from or near to the bottom of Queen Street, to the river; also a street to run northward from George Street and Duke Street, to terminate about Weaver Street.

The next act I find on this subject was obtained in 1820. In this act power is taken to make a street of 35 feet in breadth, running eastward from Stockwell to King Street, and from King Street eastward across Saltmarket to the Molendinar Burn, in such direction as the Magistrates and Town-Council may think fit, and to causeway and pave the same.

A street, 70 feet wide, was also to be made from Great Hamilton Street or Monteith Row eastward to the Cross, on the north side of St Andrew Square, and another, 60 feet wide, commencing at the west end of the Barrack Wall, running westward on the north side of the Gallowgate, and terminating at the Cross.

In 1825 an act was applied for, for extending Ingram Street eastward to the High Street, College Street westward to North Albion Street, and widening North Albion Street to the extent of 40 feet. These objects have been partially carried out by purchase, or other arrangements with proprietors of lairs in the Ramshorn Burying Ground, which lay beyond the line of the south front of the church, thus widening Ingram Street eastward to North Albion Street, by the College; by opening a passage eastward from College Street to North Albion Street; and by the widening of a considerable portion of North Albion Street.

I am not aware that any other acts than these have been applied for, for the opening up of streets. The act of 1820 was totally inoperative as far as regarded the opening of the Wynds, and the compulsory power to purchase property

expired. London Street was, however, formed by a Joint Stock Company, to which the Magistrates transferred the powers contained in this act. Various projects were started by Railway Companies for intersecting the Wynds, or placing extensive stations there; but the whole of them failed, from opposition to their schemes, or from want of funds. It is only just to the Magistrates and Councils of those times to recognise the public spirit displayed in these various efforts for the improvement of the city.

A few benevolent individuals in the year 1845 attempted to form a Joint Stock Company in 10,000 shares of £5 each, for the purpose of building houses of a better description for the working classes, and of buying up, as they could get hold of them, such old houses in the crowded parts of the city as might enable them ultimately to open up and improve these districts. But from want of support this scheme was abandoned by its projectors, after a loss of above £100 in plans, advertising, &c. The public only subscribed for about 2000 shares, the chief part being taken by a few individuals without any reference to profit.

For twenty years past this matter has not ceased to be subject of lamentation with every successive Council. But the difficulties in the way of finding a remedy appeared to be insuperable. At last, in 1847, while Mr Hastie was Lord Provost, it was proposed to the Council to appoint a Committee, to be called the Improvement Committee, who should be authorized to purchase old properties in the wynds and other crowded localities to the extent of £10,000, and to hold them for the behoof of the Corporation till they had acquired a sufficient amount to enable them to open suitable streets; to resell the ground; and to restrict the buildings to be erected as to height, number of inmates, and other circumstances, so as to carry out the views of the Council. To the honour of

the Council this proposal was agreed to unanimously. The Committee have carried on their operations steadily and quietly. They have bought above 3000 yards of ground in the wynds, and about 1100 yards in some of the very worst closes in the High Street, with a view to opening them up as has been described. By the purchases which they have made they have already acquired considerable control over all the neighbouring properties; and they hope that, by perseverance and prudence, in a few years the objects contemplated may be carried out.

It may be noticed that any attempts to schedule property, and to acquire it by Act of Parliament, have generally been accompanied with ruinous expense. But by the present plan of private negotiation, the greater portion has been obtained at reasonable prices; and where parties have evinced a desire to exact an excessive rate, they have been told that the corporation can afford to wait till parties, or their successors, are disposed to be moderate.

None but a corporate body can with advantage carry out such operations. From the continuity of their existence, they alone can, without becoming entangled with minor heirs, &c., pursue a course which may require a series of operations extending over many years. And while, as a general principle, I think it is exceedingly inconvenient for corporations to hold much house property; yet this is an exceptional case—one where the evil cannot be met by any private body, and one that is of a terminable character, as the corporation will denude themselves of all their property as soon as they have acquired the ground requisite for this object, and remain only in the position of feudal superiors.

With caution and prudence in purchasing, there is a strong probability that these great public improvements may be carried out without any ultimate loss. I have been told that

a great improvement in London, the opening of Moorgate Street, was carried out and finished by the commissioners without costing one shilling.

I would principally dread over-timidity on the part of a corporation in carrying out this work. They are too apt to regard it as an unproductive outlay—an *expenditure* of their capital; whereas it is more strictly an *extension* of it. They acquire value for whatever they buy. In my opinion, every piece of property which comes in their way, near the contemplated openings to be made, should be picked up, if the price be at all reasonable. This would give them an opportunity of forming a new line to the utmost advantage, and give greater breadth for steadings on either side of proposed streets.

Whether we contemplate the physical or moral aspect of this city, the necessity for the vigorous prosecution of such schemes appears to be urgent. When we think of the appalling mortality which has occurred amid the classes pent up in these localities—giving at all times a high average, and in years of epidemics a terrific one—we ought to be stimulated to encourage and aid, by every means in our power, these benevolent efforts. A mortality which has reached 1 in 18, 1 in 23, 1 in 26, 1 in 30, and last year 1 in 33, indicates a state of matters requiring serious attention. There cannot be a doubt that the remark of our intelligent chamberlain Dr Strang is well founded, that this excessive mortality chiefly prevails among children of the lower classes. It appears that last year 33 per cent of all the deaths in Glasgow took place among children under two years of age, and above 50 per cent among those under five. It also appears that from small-pox—a disease almost entirely confined now to the careless and ignorant classes—the deaths have been no less than 618, and that cutaneous and other

eruptive diseases have made sad havoc within the same circle. It is stated by Dr Strang that no less than 14,371 children under two years of age have died in Glasgow during the last four years, being above 32 per cent of the gross annual mortality. There can be little doubt that the health and longevity of the middle and higher classes is equal to that of the most favoured of our large cities, but that our general average of mortality is increased to an appalling extent by the disturbing circumstances to which we allude.

The evil of over-crowding, which is so much complained of, would be to a great extent prevented if architects were to exert their influence when laying out ground for proprietors. I suppose that even the 'Rookery' had an architect. On every principle of sound policy, as well as humanity, such a notorious evil should have been prevented if possible. We feel satisfied that, in a large majority of cases, over-building is a great *financial mistake*, and that a *larger return* for a *smaller outlay* will be generally obtained by following out more liberal plans.

We have large portions of unbuilt ground embedded in the city, which might have been built upon long ago if the system of towering superstructures had not so extensively prevailed. And what has been the result to proprietors in many cases but serious loss? Let any one traverse those streets which are filled with long ranges of four-storey houses—huge barrack-looking erections—and he will be struck with the enormous number of empty flats. And this applies not merely to the fourth storey, those below being all cheapened and depreciated by the crowding of so many tenants into one stair. In general, houses of three storeys are better let, and yield a much larger return for the money laid out. It would also promote domestic comfort if, in place of two doors, or

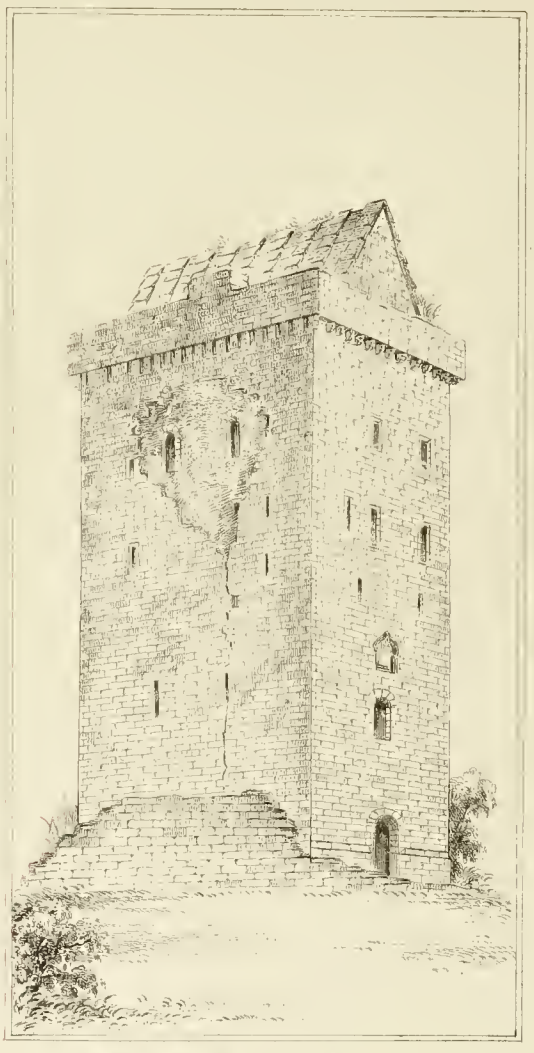
sometimes even four, on one landing-place, double staircases were erected, so as to allow only one family to enter from the same stairhead, and to divide washing-houses and erect additional boilers and washing-tubs, so as to prevent quarrels among servants and tenants.

I quite agree with the accomplished author of a paper read to this Society some weeks ago (Mr Charles Wilson, architect), as to the necessity of a building act being got which should restrict the height of houses to a proportion regulated by the width of street, and limit the number of families that may enter by one stair, and the number of individuals that may be permitted to dwell in one apartment. To these matters the provisions of our Police Act, though extensive, do not apply, except in the last particular, and that only with reference to lodging-houses. But it must be obvious that even a building act would only be operative upon unbuilt ground, and could have *no effect upon the old localities* until the properties were acquired. This is the work of the present generation; it has fallen on our hands; and I trust every patriot and philanthropist will use all his influence to promote this important object by every means in his power.

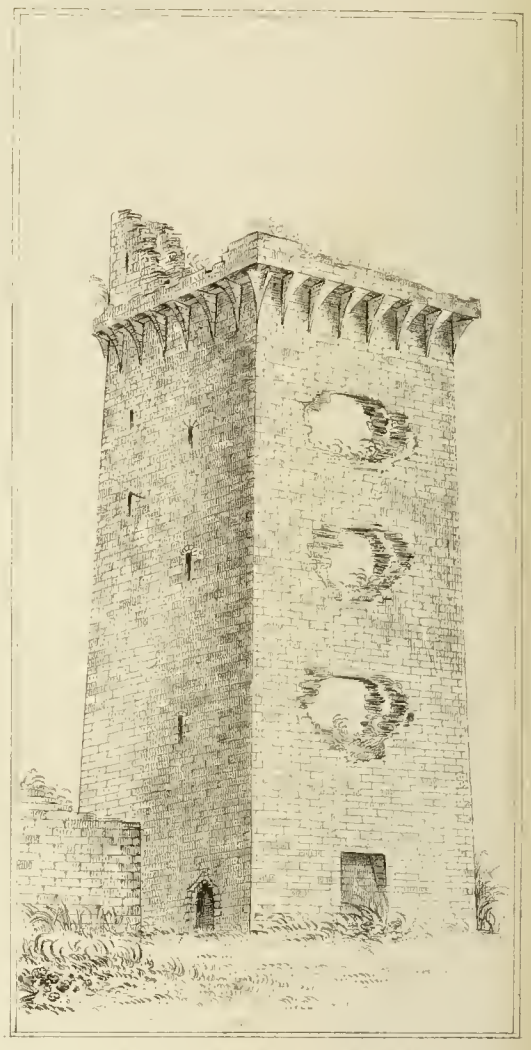
With our thorough knowledge of the evil—of the miseries that surround the dwellings of the poor—of the dangers, from infectious distempers bursting forth, which involve even the upper classes—it is imperative that we should proceed to act with energy and promptitude. On political grounds this work appears to be of pressing importance. In those deep recesses disease and crime are continually lurking, and there the dangerous classes, the red republicans of society, are reposing. But it is the repose of a volcano, ready to burst forth in a moment of excitement, and spread desolation and ruin over the surface of society.

Some have proposed, as a preferable plan, to build superior houses in better localities, and thus induce the occupants to vacate their present abodes. I am satisfied that this alone would be quite ineffectual. There is always a large residuum in a city population such as ours willing to inhabit any hovel that a wretched being can creep into. The only way to put an end to the evil is to root it out. I am not so sanguine as to suppose that the mere removal of profligate persons into a superior locality will work a charm, and restore them to the position of virtuous and reformed persons. But this I expect, that the tendency will be to mitigate the ferocity of vice, and render both disease and crime less dangerous. The softening and restraining influence of the better classes must be influential in promoting the spread of cleanliness, decency, and order, and in producing an assimilation in habits and manners. And it is only justice to add, that many industrious and virtuous persons are compelled, from the force of circumstances, to dwell in daily contact with all these evil influences, and to have their feelings and tastes shocked by scenes which they cannot prevent, and abominations they cannot control. 'Full many a gem of purest ray serene' may be found embedded in these dark retreats, only requiring to be brought to the open day to diffuse around it a radiance of surpassing light and beauty.

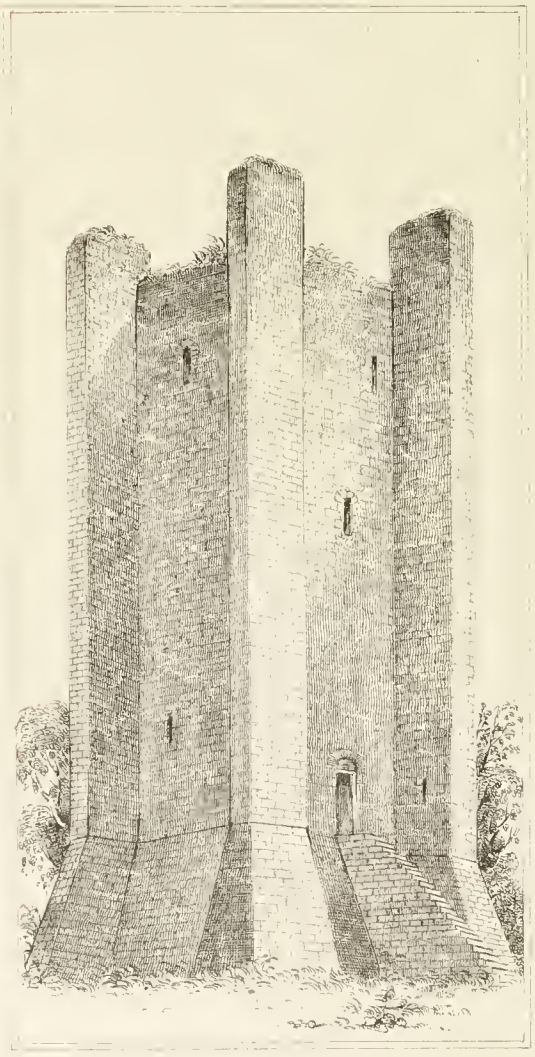
It was the proud boast of a Roman emperor that he found Rome brick and left it marble. Let it be ours that we found our city the residence of squalor, wretchedness, and crime; and that we left it the abode of health, happiness, and virtue: that we found it abounding in spots offensive to every feeling of propriety and decency; and that we left it adorned with cheerful homes, the dwelling-places of peaceful families, on which the eye may delight to rest.



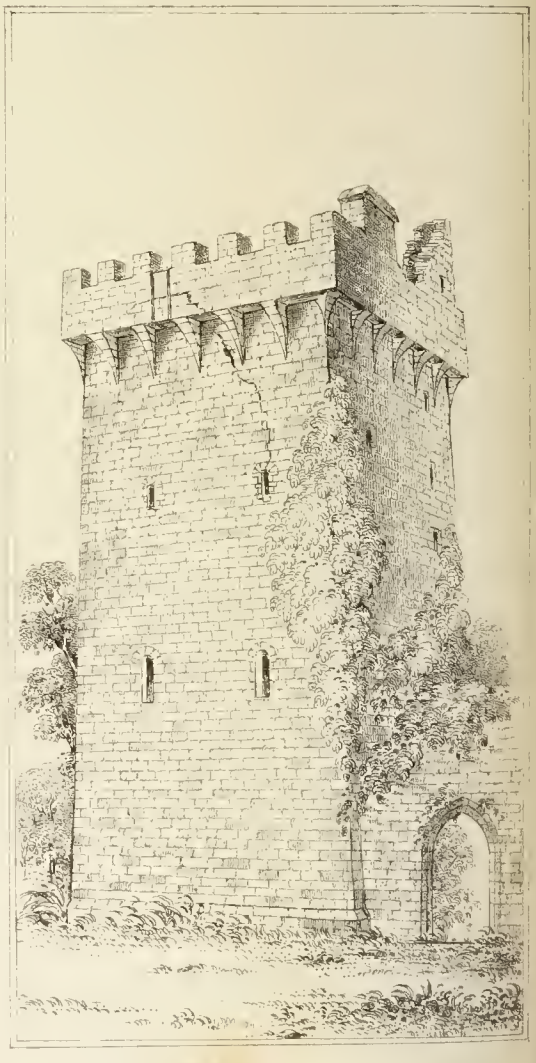
BORTHWICK CASTLE.
SCOTLAND.



KILCREA CASTLE.
IRELAND.



CONISBOROUGH CASTLE.
ENGLAND.



BLARNEY CASTLE.
IRELAND.

W. Banks, Imp.

TRANSACTIONS OF THE ARCHITECTURAL INSTITUTE OF SCOTLAND.
SECOND SESSION, 1851–52.

# No. XII.

# PARALLELS IN THE FEUDAL ARCHITECTURE OF THE THREE KINGDOMS,

AS EXEMPLIFIED IN THE CASTLES OF

## CONISBOROUGH IN ENGLAND, BORTHWICK IN SCOTLAND, AND KILCREA AND BLARNEY IN IRELAND.

BY

J. T. ROCHEAD, ESQ., F.A.I.S.

[*Read at the Meeting of the Institute in Glasgow on the 12th February* 1852.]

THESE castles have been selected from those of England, Scotland, and Ireland, and contrasted, in order to enable us to judge of the military capacities and resources of the three different nations in a species of architecture common to all of them, and to see how far such works, erected in these early ages for the purposes either of offence or defence, bear a parallel to each other as regards strength, massiveness, and situation.

We shall endeavour to point out various interesting features in those mediæval structures, chiefly bearing upon the economics of constructive art, and the merits and defects of ancient masonry; and we shall also advert to some of the more striking architectural peculiarities of these castles,

which, as being perhaps the most entire examples of feudal art to be found either in this or the sister island, must always possess a deep interest for the Archæologist and Antiquarian. It may, we believe, with truth be added, that there are very few examples, if any, in the three kingdoms that excel in architectural interest or antiquity the four strongholds named at the head of this article ; and we can say this with the greater confidence from having personally visited all of them, and perfected the drawings now before you from sketches taken on the spot. The first of these is

## CONISBOROUGH CASTLE,

in Yorkshire, near Sheffield, one of the most formidable and ambitious fortresses now remaining of the haughty Barons of England. Perched upon a steep and rounded mound of great altitude, rising abruptly from a broad green valley, stands this concentration of English feudal might and grandeur ; on one side, the huge mound is connected by a narrow tongue of land with the higher levels of the surrounding country, which apparently had in former times been cut down and excavated to a considerable width and depth (on the landward side) and formed into a dry ditch, now for the most part nearly obliterated. On the crest of this eminence are the remains of a strong line of continuous castle walling, flanked by circular bastions of great strength. Some of these are still from thirty to forty feet high. The surrounding walls enclose an area of about an acre and a half, which in general outline was of an oval form, in the midst of which, but in contact with the outer wall at its northern face, is the celebrated keep of the castle. The whole of the enclosure walls are now in a dilapidated condition ; but the keep remains in excellent preservation. It is, however, we must

add, totally unlike the engraving given of it in '*Britton's* '*Architectural Antiquities;*' where the position assigned to it is not at all that which it really occupies, whilst an erroneous impression is conveyed by the ruinous aspect imparted to it.

The keep or citadel does not stand alone, at or near the centre of the castle area, as shewn by Britton, but is part and parcel of the outer walls, projecting even beyond their outermost face on the north side. Neither is the wasted appearance so graphically and picturesquely diffused over it consistent with truth. On the contrary, it remains fresh and entire, and participates in none of the decay which is wearing down the mouldering walls by which it is encompassed. The wasting hand of time has not even blunted the sharp edges of the long perpendicular lines of its enormous buttresses, nor laid bare the interstices of the carefully jointed ashlar work, nor impaired the tenacity of its ever enduring mortar; all remains as entire as when it came from the hands of the builders. There is a mystery of late workmanship about this ancient structure, which its imputed age renders difficult of explanation; and which, when contrasted with the neighbouring line of ruinous looking walls, seems to contradict the antiquity ascribed to it; the solidity and freshness of the one and the crumbling appearance of the other exciting some degree of surprise and perplexity. Whilst decay has frittered down and penetrated into the very heart of the stone in the one case, no visible signs of its operations can be perceived in the other.

The main features of Conisborough Castle consist, as already mentioned, in a strong line of surrounding wall, and an inner keep of about 100 feet in height, by about 60 feet in diameter. The plan of the tower or keep is nearly circular —the walls being of enormous thickness, varying from 12

to 15 feet, and sometimes exceeding this, flanked by 5 immense buttresses, projecting about 10 feet, by 10 feet square on the faces, and running up to the full height of the castle walls, each of which is set upon a sloping or battering basement of 12 or 15 feet in height, having an outward inclination of from 5 to 6 feet, equal to an angle of nearly 75 degrees to the perpendicular. With these few details before us, some idea may be formed of the skill, patience, and ingenuity of those who planned and executed this huge specimen of masonry.

We are perplexed to conceive how, in those remote ages, such mighty structures were reared, and where lay the resources which called into existence such enormous piles of stone and lime.

In his history of this remarkable specimen of the middle ages, Britton, alluding to the tower or keep, speaks of it 'as 'belonging to the first ages of the Heptarchy, or to an age 'when the builders were influenced by Phœnician and Phry-'gian examples of Architecture.'

Now, we deny the presence of the Phœnician or Phrygian characteristics said to exist in the structure. There are, indeed, indications of the period of the Conqueror in the details of the chimney-pieces, and certain circular recesses here and there disposed in the inner facing of the walls,—there are features or indications of certain mouldings and enrichments, by which early and late authorities have hitherto been accustomed to calculate the antiquity of any given building. How can this be advanced as a proof that this famous old castle was the work of an age when the builders of it were influenced by pagan models?

But, to return to the author whom Britton quotes. 'From certain appearances,' he says, 'in the details of the 'building, nothing can more strongly proclaim an age of

'pagan barbarity and ignorance, amidst the disadvantages 'it laboured under, and striving to emerge from its wretched 'state to a degree of civilization and refinement.' The 'certain appearances' here alluded to are not named, but although they were, we now know the folly of relying too much and too surely upon merely external features or appearances to guide us with certainty in estimating the age of any ancient structure. No doubt there are many known exceptions to this rule, where edifices may be proved to belong to a certain century by their peculiar features and characteristics, or even by some insignificant detail. But the danger of trusting to such evidence is well illustrated by the highly interesting discoveries at Nimroud, which have revealed to us whole archives of disinterred facts, and have thereby completely inverted all our previous notions of the authenticity of Greek ornament. The chaste and beautiful ornament of the honeysuckle, the lotus, lily, and leaf, the metope roses, with their many radiating petals, the endless garlands which enriched the detail of their finest buildings, and the deep and solemn aspect of their friezes, charged with emblematic sculpture, were all, until lately, believed to be the invention of polished and classic Greece, but are now ascertained to be beyond all doubt of Assyrian origin,—the simple and intuitive designs of a simple and gifted people.

Let us now inquire into the probable era of what is popularly known as Norman (a favourite term with English architects as distinctive of that supposed era of Architecture.) In a very clever work lately published,* it is shown that the Architecture of the times of the Conqueror, miscalled Norman, was known in Ireland long previous to his invasion of England. 'It is an interesting 'consideration, that as the style of Architecture usually

* Wakeman's Irish Antiquities.

'denominated Norman was certainly practised in Ireland 'long previous to the English invasion—that it was neither 'unknown nor unused in England before A.D. 1066, and 'that consequently many churches in that country, usually 'supposed to be Norman, may, in fact, be true Saxon 'works.' With these statements before us, we shall proceed to deal with several existing facts as to the presumed great antiquity of Conisborough, and close with its general construction and insular position as a parallel to those we have yet to describe.

1*st.* We are strongly impressed with the remote but uncertain age in which Conisborough Castle and Keep were founded, and a latitude as to time is given us, which includes the Saxon Heptarchy and Norman invasion, and extends as far back as pagan times. But we would, I presume, arrive at the truth more certainly by going into the practical bearing of the whole matter, and dwelling on the evidence afforded us by the condition of the larger individual masses of the building, where we find the edges of the ashlar work, and particularly those most exposed to injury, viz., the corners of the buttresses, unusually sharp and pointed. This circumstance alone would warrant us in questioning the high degree of antiquity awarded to the keep tower—(the wall that surrounds it, as already stated, is in a very decayed condition)—and in addition to this, there exist indisputable proofs that the several floors or storeys into which the castle has been divided were formed exclusively of timber,—the beams being carried on massive insulated corbels, projecting from the inside face of walls all round, although the external walls were fitted to have borne the pressure of the usual semi or barrel arches on each floor from their immense capacity and thickness. Where, therefore, was the use or purpose of such ponderous walling? Was

it merely to carry its stone roof, or did a stone roof ever exist? It may be said that other examples are known where the walls are nearly as heavy, which are, or may have been, finished with beams and flooring, and perhaps are of equal date with Conisborough. But let any one examine for himself the castle and its walls as they now stand, and assuredly his conviction will be, that neither belong to the remote times assigned to them. If, then, we suppose Conisborough Castle to be as old as the Saxon Heptarchy, we should naturally look for the usual and never-failing accompaniment of all very early buildings, namely, the arched vaulting of each storey in succession upwards, along with solid barrel-arched roofs, grouted and run together with thin liquid hot lime into a mass of impenetrable conglomerate. We cannot suppose that thick and heavy walls, with wooden beams and common joisting, are characteristic features of the castle building of those who cleared out and succeeded the last remaining legion of the Roman army in this country,—whilst they, who were the immediate predecessors of the Saxon race, built their arches and vaulted work of solid stone, as at Leicester. Neither can we see how all the earlier strongholds and places of strength throughout these islands, judging from the known practices of the first invaders of Britain down to those of mediæval times, should have sought the strength and fire-resisting capabilities of the stone arch, while this magnificent pile, said to be from 1200 to 1400 years old, is without any contrivances of the kind. Surely there is ample room for discussion and investigation here. The castles of Scotland and Ireland of high antiquity are arched, chamber above chamber, and passage over passage, up to the line of embattled wall,—the roof itself being arched throughout with stone, and forming that curious dovecot-like excrescence which we frequently see on the tops of noted

old examples in those countries, when all later castellated examples have timber beams and flooring. The scourge of early warfare was fire. Strong built masses of stone and lime quickly succeeded the frail tenements of clay, wicker, and timber work of the rude aborigines of these islands, who gladly and prudently borrowed from the Romans their best practical lessons in Architecture. Now, if Conisborough Castle be of the rude and barbarous times of Paganism, we should, in that case, reasonably expect it to be a fire-proof structure, finished internally with that parallel degree of strength ostentatiously displayed on its external line of wall.

2*d.* We apprehend that another evidence of later workmanships exists in the enormous buttresses which gird the circular walls of this castle. We have hitherto believed all old Roman, Saxon, and Norman work to be devoid of such appendages, where walls were built 12 and 14 feet thick, making the former, inclusive of the buttresses of Conisborough, to be full 24 feet in thickness. In England, where architects profess to be well read in these matters, buttresses are disallowed in all pure Norman work; and if so, they cannot be recognised in Saxon detail by the same authorities.

*Lastly,* In support of our belief of the late workmanship of this castle, the striking fact which we have already mentioned is important, namely, that the whole line of external walls are in a complete state of ruin, though built of the same material as the keep tower, whilst the latter, rejoicing in its pristine strength, exhibits an outline nearly as perfect as when first erected.

In commenting on these remarkable features as peculiar to Conisborough Castle, we shall proceed to notice some other important details connected with it. For example, it is curious to observe the utter contempt of light and

air manifested by our mediæval architects. Here, as in other instances, there seems to have been a positive dread of piercing the thick walls for the admission of air or light, lest the perforation, however small, should render the huge structure more vulnerable. In the example before us, there does not seem any evidence of window at all beyond one or two nondescript openings near the top at an elevation of some sixty or eighty feet, and a number of small arrowlets, placed also at a cautious and wary altitude. The doorway to this keep tower, six feet high by three wide, is the only aperture by which admission can be gained, and it is situated at such a height as to be almost inaccessible, somewhat like the entrance door to the Bell Rock Light House. Modern hands have, with customary bad taste, added a straight formed line of scale steps,—sheer up to the threshold of the door,—to the grievous injury of the picturesque outline of walls.

We come now to the construction of the walls of the castle. The material with which their outside casing is executed is a hard and compact oolite limestone, built in regularly squared courses of ashlar work of from 8 to 10 inches high, whose joints and arrises are positively as perfect as when laid in the walls by the hands of the operative. We also remarked in the walls of this singular building, that the masses of their inner thickness were composed of small and angular shaped stones, which, being grouted with liquid mortar, made up of sand, lime, and gravel, well tempered, acquired all the strength and durability of a solid mass of stone. This method of concreting the walls, both of castellated and ecclesiastical edifices, and thereby rendering them indestructible, is observable in all structures of an early period. But here (and as shall be afterwards noticed in a similar case) great pains and labour seem to have been be-

stowed to render the walls thoroughly impregnable; yet we found the carefully laid ashlar work was but slenderly connected with the enormous amount of the grosser material behind it, and that no very great degree of violence was necessary to detach it, showing that much of its apparent strength was deceptive.

Conisborough Castle is, in our opinion, the only English specimen of Architecture that at all approaches our Scottish or Irish feudal castles in sternness and simplicity of character. Besides occupying the lofty crest of a nearly insulated and steep grassy mound, in the midst of what may be termed the Highlands of England, it commends itself to our notice as being an excellent parallel to those of Borthwick, Kilcrea, and Blarney Castles—all of them being nearly alike in height, width, and depth. In the one instance, however, that of Conisborough, the plan of the keep is nearly circular, while the others are square; but this difference is counterbalanced by the fact that the bastions which gird the outer line of walls of these examples are in every instance round or square, from 20 to 30 feet diameter, showing that the mere plan or shape of the bastions or keep towers was entirely optional, and not a feature in itself distinctive of an era.

## BORTHWICK CASTLE.

We shall now proceed to bring under your notice the celebrated structure known as Borthwick Castle, situated in the shire of Edinburgh, and about 10 miles south of the city of the same name. It stands on the extremity of a lofty ridge of land, which terminates somewhat precipitately at its eastern extremity, in the centre of a long strath or valley, surrounded by hilly eminences on every side. The date

which tradition assigns to it is somewhere about the year 1430. Its situation is all that could have been desired before the introduction of artillery—being well protected on all sides but one by deep and precipitous banks, whose margins, at the bottom of the valley, are laved by a stream, which answered the double purpose of supplying the castle with water, through the medium of a deep draw-well, and of becoming an additional protection to those within on the sudden approach of the enemy.

The walls of this feudal fortification are still, to a great extent, entire. A large portion of the curtain or wall forming the chief entrance to the castle is worthy of our best attention, as exhibiting a fine and well-preserved example of defensive walling and strongly casemated round towers, at the weakest point of attack, viz., on the landward side of the ridge upon which the castle is built. Here we may yet see the warder's loop-hole visi, narrow within, and cavern-mouthed without, and so placed as to command all those who approached the castle gate, and subject them, so to speak, to a raking scrutiny ; and here the inner portcullis lifted up its iron jaws ere the massive outer gate opened and grated upon its huge rusty hinges. Great labour appears to have been bestowed in building that portion of the original walls now extant. The arched or vaulted work is of the strongest description. The stones forming it are in no case thicker than 3 or 4 inches by 2 to 3 feet in length, perfectly squared off, and laid hard to hard with lime of unyielding tenacity. Inside, the walls are built with scrupulous care, and are faced with ashlar work in regular courses, the same as on the outside. The great bastions which flank the entrance gateway seem to have suffered to a considerable extent from some relentless besieger, whose fury ended not till it had destroyed one-half of the original height of them ; for we plainly can see

the addition made to the walls, from the circumstance that it has been executed with stone of a perishable nature, selected without that investigation into its lasting properties which the early knights or barons of Borthwick appear to have bestowed upon the choice of the stone with which they built the original walls. On this all-important object our feudal ancestry evidently bestowed much greater attention than we are usually in the habit of giving them credit for. Their zeal and foresight in securing the best and most lasting materials, whether these were of stone or timber, is remarkable. The mortar they used was of adamantine hardness and durability, unequalled at this day for adhesive properties, and after the lapse of centuries (as in the walls of Conisborough), it still clings to the stone work. The pulverizing chafe of four hundred winters, and the soaking rains and scorching drought of four hundred summers, have not rotted down nor impaired the strength of this singularly well mixed material. Whence, then, that freemasonry that made the secret of this unyielding and tenacious mortar patent to the people of these lands from after the time of the Romans down to the extinguishing times of a Cromwell, from Duncansbay Head to the Scilly Isles, and across the country from the mouth of the Humber to the embouchure of the full-flowing Shannon? Have we for ever lost what was known to our half-peopled, half-civilized countries of old, or is the mortar mixed in these times equal to that of our forefathers? We fear not. Amidst our excess of knowledge, we do live in a cheap and artificial age. The solid and enduring is overlooked, and the tawdry and flimsy style is encouraged.

The court-yard of Borthwick Castle is of the same size as that of Conisborough, viz., about 1½ acres, within which is the keep-tower, also situated, like that of the latter castle, near to the north side of the whole area, and close to the

boundary wall. The keep-tower is 120 feet in height to the apex of the stone roof, and the walls nearly 13 feet thick at the base. On the level of the third storey they vary from 6 to 10 feet thick. This tower is about 70 or 80 feet square, with a cleft or indentation on the western side, of 12 or 15 feet in width and depth, all the way up to the height of the parapet walls,—in itself a very uncommon looking feature in the construction of this castle, and not easily accounted for, though some allege that it is designed to admit light, and yet be a protection to these apertures from the assaults of the enemy. We do not coincide in this conjecture, for the sufficient reason, that these apertures admit a dubious light in such a deep-seated recess; and, secondly, as not affording any protection from the enemy at all, the flight of whose arrow would be guided more surely to its object, while the besieged could not in return shoot their cross-bows round projecting corners or wings of the building. Moreover, this curious cleft faces the chief entrance or gate-way to the castle, where we should have anticipated a proper distribution of sharp-shooting arrowlet openings piercing the face of the castle walls.

The internal division and subdivision of this keep-tower is perhaps more cunningly devised, and seemingly much more extensive, than the other examples we have quoted. In the northern wall are two entrances to this stronghold, neither of which can be properly assumed as being chief over the other, both having claims to superiority. Tradition relates that the uppermost entrance of the two had an ascending scale-stair somewhat similar to that we have described in front of the entrance to the keep-tower of Conisborough Castle, and the fact is partly borne out by some existing appearances of the steps abutting on the wall face. But such an entrance as this could not have existed prior to

Cromwell's time, though it is possible that the modernizing spirit of the later Lords of Borthwick, after the bombardment of the castle in 1650, may have added it. Be this as it may, the lower entrance on the ground level shows signs of a chief entrance, and that, too, of great antiquity, being low and solidly arched. Chamber after chamber, on the ground level, up through three, four, and five storey floors, and smaller compartments, are arched over in the most complete and careful manner. Nothing can exceed the perfection of the stone vaulting of this castle. It is put together with apparently unwearied care, every joint fitting closely to a fault, each of the stones being narrow and long shaped, as we have elsewhere remarked. All the apertures for air or light are circular, arched inside, though showing square-headed externally. If we, for instance, suppose an external opening to be of the width of 9 or 10 inches, its internal breadth is as much as from 8 to 12 feet, thereby admitting a light to a far greater extent than most persons would feel disposed to believe. All the door-ways, after passing the chief entrance, are of a dwarfish make and height, so that the enemy, if he did gain admission, had to bow his neck on passing from one vaulted chamber to another, and not having sufficient light to guide his way, was liable to be cut down in an instant by a stroke from an unseen hand. We had the greatest difficulty in groping our way to the main wheel staircase, although we had the benefit of as bright a day as ever guided the inmates of the castle from one storey to another; but the darkness was a studied matter, to secure the castle's safety in times of difficulty. The numerous inlets and outlets, the crossing and recrossing of one path to another, is indeed wonderful and intricate, and planned to admiration. On the ceiling of the great audience hall, or chamber, we observed several inscriptions

in black letter, with half obliterated paintings of canopied architecture. The ground storey of the castle appears to have been set apart for dungeons, having little or no light, and what is admitted streams downwards from an outlet opening through the long angular thickness of the walls, admitting a narrow ray of light, at a height of 30 or 40 feet. The next storey is occupied partly by the audience hall, as we have said, including also the kitchen and other apartments of lesser magnitude. In the hall the fire-place is of unusually large dimensions, and of most exquisite workmanship, the jambs being of massive projecting pier pillars, full 12 feet asunder. The whole are carried upward nearly to the arched ceiling or roof in a pyramidal form of admirable proportions. This magnificent fire-place has suffered, like many others, from modern vandalism. It is not so entire as our guide (an old man) remembers it some half century ago. Modern hands, he told us, broke down a whole staircase for the sake of the steps, despoiled the roof of its heavy stone slab-covering, and hurled it from the full height of the battlements. The Goths who performed this shameful work, we were told, had their toil and labour without reward, as the massive slabs of stone were not strong enough to withstand the shock of being unceremoniously pitched from a height of upwards of 100 feet. After the same fashion the beautifully proportioned fire-place of the audience chamber was destroyed, which, even in its present condition, is one of the richest and loftiest we remember to have seen—all of polished ashlar work. The style is early English ; although in this same hall we have examples of Henry the Eighth's period, and, to crown all, the semicircular arches of the so-called Norman period. The ceiling or roof of this hall is equilateral, so that, according to the common division, we have here three distinct styles. Now, if the date of this castle were not fixed beyond doubt,

who should amongst us feel nerve enough to fix its proper era? For here we have lively specimens of the vigorous architects of the thirteenth century, and the disabled doings of the exhausted men of King Hal's time, and beyond all, we have perfect imitations of what is said to belong to the era of the Conqueror. How false, therefore, it is to rest on the outward tokens of the architecture of buildings of ancient date for a true index to their age or era. The early English work we have described as belonging to the jambs of the great fire-place of the audience chamber is quite equal to the breadth and character of that style in the Cathedral of Glasgow.

Above the audience hall is what now passes under the appellation of the castle chapel, a large magnificent apartment—having a stone arched roof much loftier than that of the hall immediately beneath it. In this chapel are still to be seen the remains of more than one piscina, situated in what, in all probability, were set apart as so many side chapels. The windows of this noble apartment are much larger, and a greater body of light is thereby admitted, which sets off its stately proportions to great advantage. Here was also another marvellous example of a richly decorated chimney-piece, but a mere fragment of it now remains, yet sufficient to show what it must been, when the unfortunate Mary Queen of Scots was carried off, and remained within its walls, by the Earl of Bothwell in 1567. The staircases within the castle walls are three in number, of which by far the largest,—a fine example of a wheel staircase of solid polished ashlar work—was ruthlessly destroyed half a century ago for the sake of its material; and it is a melancholy spectacle to look upwards from the lowest level of this spacious winding stair, and behold the spiral form of the ample wide-spread steps broken off a few inches short of the walls. One sickens at the sight of such wholesale devastation for the base and paltry

purposes of fitting up some wretched cot-houses or barns in the immediate vicinity. Arrived at the top, we pass easily round the steep pitched roofs, covered with huge stone slabs, checked into each other with admirable precision and nicety, and in all respects nearly as perfect as when first they were bedded. Here and there, however, we see decay insiduously working its way into them, and vegetation occasionally bursting through and aiding its operations.

Around the pigeon-cot roof tops there is ample room for working a battery of cannon of small calibre, though this never was at any time attempted. The immense corbel tables that carry the parapet walls project so far out that we are lost in amazement at the hardihood of those who ventured to build them. The whole line of corbelled parapet walling is decidedly the boldest and most perfect specimen of the kind we have seen, and is well worthy of a visit. The spaces between each corbel are open, most likely intended for the escape of rain water, and perhaps also for pouring down burning sand, melted pitch, &c. upon the heads of the assailants, so soon as they gained admission to the court-yard, and began to operate upon the walls of the Keep-tower.

As we pass round to the east face of the castle wall, our patriotic feelings are excited, and our Scottish *amor patriæ* roused, as we look upon the wanton and barbarous mutilation it endured at the hands of that destroyer of all our best strongholds—Cromwell. He whose errand it was to subdue the mighty barons, and blunt the edge of feudal rule, sought out this lonely castle, and despite the hilly and roadless nature of the country around it, brought up his battering train in full array before its walls, and did fearful execution. The spot is still shown whence he fired upon the courageous garrison. It is a consi-

derable eminence, distant from the eastern wall about five hundred yards; and from this point he mercilessly poured out his round or chain shot till he cleared off the entire east face of the corbelled parapet, and tore away a large section of the ashlar work, and finally split the thick wall from top to bottom by the fierce concussion of his artillery. The ashlar work being, as we have already stated, in no way bound to the mass of material behind, fell away in large patches, which, in their turn, have caused other portions to tumble down within these few years past. The parapet walls so demolished appear to have been repaired; but instead of being corbelled, they are carried straight up with the line of the main walls.

Tradition states that Borthwick Castle was betrayed, and that Cromwell was privily informed of the weakness of the wall at the point which he ultimately bombarded. It so happens that the point he fired at is immediately at the back of the great fire-place or chimney of the chapel, which we have already described. The walls here are only about six feet thick, in consequence of the recessing of the jambs and the great width between them.

Cromwell, when he reached Edinburgh, naturally found out who, among the barons of the country, were for or against him. Among the latter was the Lord of Borthwick, who was at once summoned in the following letter:—

'For the Governor of Borthwick Castle, these.*

'Sir—I thought Fitt to send this Trumpitt to you, to let you 'know, if you please to walk away with your Company and deliver the 'house to such as I shall Send to receive it, you shall have libertie to 'carry off your armes and goods, and such other necessaries as you have.

* This letter, slightly varied, is given in Carlyle's Letters and Speeches of Cromwell, vol. ii, p. 261, and is there quoted from Russell's Life of Cromwell, vol. ii, p. 95.—Ed.

'You have basely, inhumanely, murdered a man. If you necessitate 'me to bend my Canon agt. you, you must expect what I doubt you 'will not be pleased with. I expect your present Answer, and rest 'your Sert,

'O. Cromwell.

'*Edinburgh*, 18*th November* 1650.'

Bravely as the above summons to surrender was got up, it had not the effect of shaking the nerves of the then valiant and courageous defender of Borthwick Castle, who manfully stood out till the havoc of cannon shot despoiled the entire upper face of the east castle wall, completely knocking down the magnificent corner battlements and corbelled parapet walls, and splitting the wall throughout its whole height. Then, and not till then, did the hardy inmates sue for honourable terms, which were mercifully granted them by Cromwell, who soon after withdrew his force.

## KILCREA AND BLARNEY CASTLES.

We now proceed to notice as parallel specimens to the English and Scottish baronial strongholds, the ancient Irish castles of Kilcrea and Blarney, both situated in the county Cork, and about twelve miles south-west from the city of that name.

Kilcrea is a lofty and magnificently proportioned keep-tower, from 90 to 100 feet in height by about 60 to 70 square at the base, gradually tapering upwards to the line of battlements on all sides to the extent of three feet each face of wall within the line of the perpendicular—the walls being 12 feet thick at the bottom and 8 feet at the highest point now standing. The internal economy of this remarkable example of Irish feudal architecture is much the same as in

Borthwick Castle, each storey being a series of barrel or equilateral headed arches thrown over chambers of large dimensions, very imperfectly lighted on the first and second divisions of the castle, but on the uppermost levels now remaining the windows begin internally to partake of the oriel character in width and shape. The summit of the castle bears undoubted signs of having been finished with the dovecot-looking termination found in most of our ancient Scottish keep and peel towers. Here, supporting the stone roof of the highest chamber—a really splendid apartment, nearly embracing the whole square of the tower—are the remains of a beautifully wrought equilateral arch of large hewn stone, which, rising upward above the level of the battlements, was covered over with large slabs of stone, disposed in oblong squares, or ridge and furrow style, alternately. One most remarkable feature belongs to all the old feudal castles of Ireland, that is, the immense depth and peculiar form of the corbel tables of the parapet walls. These are from 8 to 10 feet deep in this and other kindred examples, and projecting upwards and outwards with a bold sweeping curve, form in our estimation one of the strongest description of stone corbelling. Commencing on the face of the wall, literally at nothing, and course after course of solid masonry, expanding itself gradually till it reaches the under side of the overhanging parapet wall, there cannot be a more graceful form of supporting stone work. Around the base of the structure is an extensive court yard, which at one time had been defended by strong walls and towers, as in the other examples we have quoted; but, with the exception of one portion, which formed the drawbridge entrance, the whole has been razed to the ground. Besides these parallel features of defence, there is yet another: this splendid castle still retains its broad and ample moat, about 30 feet broad, very deep, and full to the

brim of water, a condition in which ancient moats are now very rarely to be seen.

The walls of Kilcrea keep are built of a hard grey limestone, which admits of a beautiful polish—an example of which exists in the steps of the wheeling stairs, which, being formed of slabs of limestone, have in the course of time been polished by the friction of human feet till they have acquired the smoothness and intensely black surface of our modern black marble mantel-pieces. The outer and inner walls of this castle, like those of Borthwick and Conisborough, are composed of ashlar work, laid in regular courses, and are, with the single exception of those parts destroyed by Cromwell, quite entire. The materials composing the inner backing up of these walls are exactly similar to that we have stated as belonging to the preceding examples; in short, there seems to have been but one prevailing form and usage adopted in the construction of these ancient walls—a description of work which seems to have been as well understood in Ireland as it was in Scotland or in England. How very different is the state of matters now in all the three countries. No uniform style of building is adopted, nor is any selection of material made—points which occupied the most serious attention of our rude ancestors, and enabled them to rear edifices which we find to be all but indestructible. The work must now be done in a hurry, from ill digested plans. The quarry whence the stone is to be obtained is never made subject of inquiry; neither is the quality nor the proper preparation of the mortar the subject of a moment's consideration. Anything is mortar that will work with a trowel. The building is built and finished, come what may. What a contrast does this present to the cautious, deliberate, and leisurely times of old!

At the time we visited Kilcrea Castle, in 1848, it was surrounded on all sides by grassy swamps; and it is related of Cromwell that he had to drag his cannon on hurdles to the point of bombardment, whence he fired at the walls of the castle from off a breast-work of hurdles and turfs. The frightful vengeance that overtook its wretched inmates may be conceived from the dismantled condition of the whole fabric. The thick and massive walls are riddled and shot through storey after storey. Tradition says of this fine old castle that it too, like Borthwick, was betrayed into the hands of Cromwell, by its being made known to him the exact spot on the north wall down which the trunk line of the privies were conducted to the moat beneath. The walls being thereby thinned and seriously weakened, easily fell a prey to the cannon of the crafty besieger, who perhaps smiled as he found out wherein the mediæval architects, though cunning workmen, had grievously erred in planning the castle walls at that point, not having dreamt of the force and power of his shot and shell.

That there is an appearance of wanton and wholesale destruction in the siege of this castle will not be denied. Honourable terms were offered, accepted by, and secured to the defenders of Borthwick Castle by Cromwell, who, though he irreparably damaged its ponderous walls, desisted from any flagrant spoliation of the structure. Very different, however, is the course he pursues in Ireland, where, far from the notice of the then civilized world, he dealt out subjugation to the Irish with a heavy, if not an exterminating hand.

These remarks bring us to the last example we have to submit to your notice—that of Blarney Castle, close by which still flourish the celebrated Groves of Blarney. The castle stands a few miles to the westward of Kilcrea, finely

situated upon a projecting table-land rising out of a swampy meadow, which protected it in evil days by keeping the enemy at a safe distance.

Blarney Castle resembles very closely that of Kilcrea in the height and thickness of its walls, also in the form of its corbelled battlements, as well as in the tapering line of its castle walls. It has, however, been sadly mutilated by the cannon of Cromwell. The whole of the spacious arched stone roof of the uppermost chamber was entirely destroyed by him, as well as the walls that faced the besieging ramparts. Blarney Castle was, as regards situation, more open to attack from artillery than Kilcrea, yet the one has suffered quite as much as the other ; though, in as far as the parapets in Blarney Castle are concerned, they are more entire, as well as the curious looking, wedge-shaped corbels which support them. Several very interesting and curious architectural features still exist in this castle, such as the oriel window, which exhibits a very simple, economical, and certain method for carrying the overhanging weight of stone, the lintel of the kitchen fire-place, where we find the same studied economy of material, and above all, the arched ruble work, forming the steps of wheel staircases, which appear to have been cast, or turned on frames of osier or wicker work, of about 8 to 10 feet long, the marks of which are still to be seen, out of this mass of concrete arched ceiling work, in which were notched the treads and risers of the stair, all being lined with thin slabs of grey limestone, polished by friction, like those at Kilcrea. The same spirit of masonic economy may also be seen in the old cathedral church at Limerick, where the stone staircases are in every respect after the same plan. What renders this method of construction all the more curious is, that the wheel staircases of Blarney Castle are built

without a newel or support in the centre; they are quite open, which renders it puzzling to conceive how the builders contrived to execute their work, and preserve the solidity of it unbroken, with such uncouth materials to perform a skilful work 'of art, maintaining the spiral curve in 'perfection, from the bottom upwards, and showing an arched 'roof, having an abutment on one side *only.*' We do not remember ever to have seen or heard of any other instance of this cheap and ingenious method of erecting a wheel stair. Another peculiarity observable in the formation of these stairs is their narrowness: one which we ascended was under 4 feet 6 inches diameter, but wanting the solid newel.

We ascended with comparative ease, having a width of staircase perhaps equal to 5 feet 6 inches instead of 4 feet 6 inches diameter, which is certainly a good contrivance for saving space in staircases, where such saving is a desirable object. In this famous old castle is to be seen the renowned Blarney stone, to which all faithful swains pay court, and vow their vows of love, and plight their troth, concluding their devotions by kissing it. This symbolical piece of carved work is on the highest tower point of the castle walls, overhanging the valley beneath at an altitude of 150 feet, which it requires some nerve and fortitude to reach. It is somewhat singular that the device of the Blarney stone is the representation of two rings, about 6 inches diameter each, the one linked to the other. One of the rings has been partially obliterated.

From what has been said, we think a few interesting general facts are made obvious:—

1*st.* It will be perceived that in all the structures of which we have endeavoured to give some account, choice

of situation was an all-important point with our ancestors, involving much nicety of selection, sound judgment, and good taste. In Conisborough Castle, a steep and abrupt mound of great height is chosen, and all its natural difficulties of access increased by art. In Borthwick Castle the same considerations seem to prevail, its site and position precisely resembling that of Conisborough. In Kilcrea Castle we find the place chosen to be a spongy swamp—the only site procurable in a flat mossy country—surrounded by a deep ditch, no care being taken to force any roadway to it above the ordinary level, if, indeed, a road of any kind ever existed. Blarney Castle, again, partly occupies a bluff piece of table land, and partly a piece of swampy ground on its north front. In these, then, we find a strong coincidence of position, and an evident care in the selection of the most suitable spots.

2*d*. It is found that all these old castles have inner keep towers of uniform height—citadels of refuge—within a strong line of walls and round towers; and these towers again are remarkable for their identity of construction, being faced within and without with ashlar work in regular built courses.

3*d*. It is noticeable in each and all of them that extreme attention is paid to the height and width and number of openings on the two lower storeys, none being wider than a few inches, and in every instance the doorway is low crowned or arched, and in no case exceeding from 3 to 4 feet.

4*th*. A uniform and great thickness of wall is apparent, graduated to the top, either externally or internally. The material of which the grosser portion of the walls was formed seems to be of the same description in all cases, while the larger openings are all in the uppermost chambers.

5*th*. The perfect resemblance of all in their ample fireplaces, which project several feet from the inner surface of

walls into each chamber, the lintels being jointed after the same fashion in detached pieces.

*6th.* There is evidence that each castle was terminated with a stone arched roof, with certain hollow chambers set in the thickness of the wall.

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# No. XIII.

# ON GREEK ARCHITECTURE.

## PART I.

BY

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[*Read at the Meeting of the Institute at Edinburgh on 25th March* 1852.]

The end proposed in this paper is an examination of a system of Architecture almost universally acknowledged to be the most perfect that has been developed, for the purpose of deriving from it, or of illustrating by it, the general principles of the art. Our work divides itself into two parts; *first,* an examination, in their forms and expressions, of the elements which enter into the composition of Greek Architecture; and *second,* a consideration of the principles on which these elements are associated together. I confine myself this evening to the first part of this division.

We know little of the Architecture of Greece in its best days beyond that of its temples. These were undoubtedly the principal as well as the earliest buildings of the Greeks, and their ruins are almost the only architectural

remains of that people we have. But whatever their temples may have been to the Greeks, they have become the models of our Classic Architecture, and therefore our attention will, in this essay, be confined to them.

Of the Temple Architecture of the Greeks, again, I shall consider only one style, namely, the Doric,—the first, most widely spread, most characteristic, and the best style of Greek art.

There are remains of upwards of twenty Doric temples, many of them in a comparatively perfect state, so that we have a complete insight into the whole detail of the style.

The simplest and smallest form of the Doric temple was that of a rectangular cell, with a small portico composed of two columns, *in antis* (as it is termed), at one or both ends. This was formed by the continuation of the lateral walls of the cell beyond the terminal walls, and by placing columns between the continued portions.

The second form was made by surrounding the first with a peristyle, that is, an entire circuit of columns, which thus generally consisted of six columns at each end, and about twice that number at each side. We have two examples in which the number at each end was eight, and on each side seventeen. The peristylar temple is the complete development of the Greek temple.

As the plans of the Greek temples were little varied, so were the members of which the buildings were composed.

The cella, enclosed by walls, was, as we have seen, sometimes preceded, or completely surrounded, by an open colonnade. The columns stand on a common foundation, termed the podium or stylobate. Above the columns is the entablature. At each end a gable or pediment surmounts the cornice.

The stylobate consists of three large steps or stages, each

equal in height to about one-third of the diameter of the column.

The column is a cylindrical carrying body, having its axis, for all practical purposes, vertical, gradually diminishing in diameter as it ascends, and forming itself so as to receive the entablature. The mode in which it thus forms itself is by a swelling enlargement crowned by a square slab.

The column consists of the shaft and capital; the latter composed of the neck, with grooves or channels as a separation from the shaft, of the echinus or ovolo with its annuli or rings, and of the abacus.

The entablature is divided into three parts, namely, the architrave, a simple square mass which unites the supporting columns into rows; the frieze, which surmounts the architrave; and the cornice, the overhanging covering portion which belongs to the roof. Separating the architrave from the frieze is a thin projecting member called the tænia, to which are attached the regulæ with the guttæ or drops.

The frieze is composed of the triglyphs over the columns and intercolumns, and of the metopes.

The cornice is formed of the cymatium, with a small slab above; of the corona, consisting of a large plate projecting obliquely on all sides, but terminating perpendicularly; and of the mutules, hanging from the under side of the corona.

The roof consists of a central ridge, inclined to both sides, with gables at the ends. These gables are about one-eighth of their width in height. They are composed of the tympanum, and of the corona and sima above the tympanum, and are surmounted by the acroteria, pedestals at the corners and on the summit for carrying carved ornaments.

The sloped sides of the roof consist of flat and hollow tiles of marble, clay, or bronze. The eaves are surmounted at inter-

vals with elegantly ornamented tiles or marble ornaments. These are not only placed above the eave tiles, but run along the ridge as an elegant ornament.

The enclosure of the cella within the columns is composed of a wall regularly coursed, and faced at the projections with '*antæ*' or pillasters. This enclosing wall has base and cap mouldings running along it and round the antæ. Those of the cap especially are generally composed of a number of minute members. The antæ are simply facings of the walls, and were never placed in rows.

The time that elapsed from the date of the oldest known temple to the perfection of the art, or rather to the commencement of its decline, was not more than 300 years.

The principal alterations which took place during that time were in the general proportions of the order, in the diameter of the columns, and in the height of the entablature, both of which underwent a regular diminution.

Having described and pointed out the members of the Doric temple, I shall now proceed to examine into their expressions; and in doing so it is unnecessary to consider the motives which influenced the Greeks in the adoption of certain forms and arrangements. Doubtless, their Temples did, from various circumstances, possess meaning or expressive power in their eyes which are not apparent to ours. My purpose is to describe and account for such expressions as are now apparent—expressions arising from no religious associations or symbolical significance, but merely from the beauty of the members, and from the mode in which they are combined.

The matters to be considered come under the heads:

I. Of general plan; and,

II. Of individual members.

I. On the general plan of the temples.

This was the simplest of all forms—an unbroken oblong. Various reasons have been given for the constant use of this form.

What the real reasons of the Greeks were we cannot now say with certainty; but the following seem sufficient, *first*, for the preference of a rectangular plan to one of any other form, and *second*, for the preference of an oblong plan to a square one.

*First*, Reasons for the preference of a simple rectangular plan to an irregular one.

1. The simplicity and fitness of such a plan for the uses required.

2. The conformity to the severity of the style found in that simplicity.

3. The perception that an irregular building requires some ruling and rising part to complete and connect its various portions, while a simple rectangle is complete in itself.

4. Its allowing of a long perspective, with equal light and shade on all similar parts. Without such equal light and shade, similar parts would not have had similar expressions —a circumstance wrong in itself, and tending to confuse the expressive power of the whole building.

5. Another reason seems to lie in this, that whereas one striking characteristic of the Doric style is that all leading lines are horizontal, all secondary ones vertical; in a broken plan this effect would have been very much destroyed, unless the lengths of the parts had exceeded very considerably the heights of the vertical members. This could not have been the case, unless the whole building had been greatly enlarged, and it could not have been so without becoming disproportionately low.

*Second,* Reasons for the preference of an oblong plan to a square one.

1. One reason will be found in the following passage:— 'The temple being a single room will have the best effect 'when the eye on entering can embrace the largest portion 'of it at once, for it is impossible ever to see the whole 'interior even from a corner, because the eye cannot receive 'distinct impressions over a circle of the retina more than '45°, or at the utmost 60°, in diameter. Now by taking two 'lines fixed at this angle, a folding rule for instance, and 'laying it on the plan of any room, you will find, by moving 'it about, that position in which they include the greatest 'portion of the area; and it will be found that the more an 'oblong room deviates from the square, the more of it you 'can thus see at once; and that when the room is a double 'square, or longer, the best position for the point of view 'is the centre of an end, and the worst is the centre of a 'side.'*

2. The comparative difficulty of roofing a square building of the same area, at least without making the roof disproportionately high.

3. The still greater difficulty of finishing the roof externally, so as to have a good effect. The equal extent and importance of the four sides of the building would have seemed to require a similar mode of finishing the roof over each of these sides.

4. In order to include in a square plan an area equal to that embraced in an oblong one, it would have been necessary to have made the temple of greater breadth, and this, from the nature of the style, would have led to a less proportionate height.

* P. 139.—Rudimentary Treatise on the Principles of Design in Architecture, by E. L. Garbett, Architect.—London, John Weale, 1850.

II. Let us now proceed to consider the individual members in their order :—

1. The *stylobate* or *basement*, as I have already mentioned, consists of three distinct steps or stages, together nearly equal in height to a diameter of the column, and running in an unbroken rectangular plan completely round the building. The peculiarity of this basement is its unbroken plan.

The use and nature of the stylobate have been very variously stated. By some it is held not to form part of the columnar order at all, and is therefore generally omitted in works on the orders. But it matters little whether in theory it is counted part of the order or not. In effect, the column cannot be separated from that on which it stands.

The first and most important effect of the stylobate is to serve as a platform for the building, to raise it above the ground, and to give it elevation, dignity, and a secure and firm footing. It is felt by all who have written on it to be a necessary balance to the entablature, and its threefold division has by some been considered as intended to correspond to that of the entablature.

It has also been considered important in heightening, by repetition, the effect of the parabolic curve formed by the stylobate in common with all the other horizontal lines of the building. This is a somewhat fanciful reason. The curve alluded to is far too refined to be detected by a common observer, and, while undoubtedly contributing to the effect of the building, is discoverable only by measurement.

The following seem better reasons for the threefold division of the stylobate.

The height of basement required in order to give the temple sufficient elevation was generally so great that, if divided into only two stages, these stages would have appeared heavy and clumsy in proportion to the members above them. Again, a stylobate extending to the usual breadth round the temple, but divided into only two stages, would not have exhibited that effect of spreading which materially conduces to the expression of stability. The edges of the risers would have been too far apart to be easily connected by the eye; and, even had they been closer together, there would have been nothing to lead the eye to connect them by a line. The temple would simply have appeared to stand on a thin platform, forming, rightly speaking, no part of itself. The interposition of a third part carries the eye along, and connects the base of the pillars with the lower member of the stylobate.

Again, the number of steps serves, by repeating the horizontal line, to mark more strongly the horizontality of the stylobate. Had the basement been divided into two stages, this horizontality would scarcely have been marked at all, for the only line in it which would have appeared perfect would have been that of the upper edge of the lowest step. The edge of the upper step is broken, and confounded by the bases of the columns, and the ground line of the lower step is almost blended with the ground itself.

This expression of horizontality is important, as it strongly indicates the weight and mass of the basement, and the firm poise of the building on the ground.

Again, had there been only two steps, the unity of the basement would have been destroyed. The higher step going vertically down from the bases of the columns would have appeared so connected with them as to have made it seem something altogether distinct from the lower step.

These, then, seem all reasons for the threefold division of the stylobate.

The height of the stylobate, then, gives elevation and dignity to the building. Its unbroken plan gives continuity and unity. Its threefold division serves to mark its separate and distinct nature. It also marks more strongly its horizontality, and, with that, its stability and firmness. These qualities are also expressed by its spreading, which again is made obvious by its threefold division.

Another effect of the stylobate besides those formerly mentioned is to bind the whole building, as it were, into one. The columns seem to shoot out of that which is in itself one, and thus to be closely bound or connected together. Thus also it helps to give the effect of unity of nature and purpose to the columns.

2. We have now to consider the *column,* the most important member of all. The principal things to be observed in it are its plan, its want of base, its fluting, its rapid diminution, and the deep groove in the shaft, a little below the echinus.

One would imagine that the circularity of plan of the column would scarcely need to be accounted for. Its obvious beauty appears a sufficient reason for its adoption ; but other reasons have been sought. Some suppose that it was used in imitation of the trunks of trees—the fluting representing the rugged bark ; while others suppose it to have been adopted for the sake of convenience—square columns occupying too much space when placed together. We may be contented by finding the principal motive in its manifest beauty.

The peculiarity of the column is its want of a base. For this want reasons of various kinds have been given. A base, it is said, would be too bulky, it would overbalance the capital, and it would too much lessen the passage between the

columns were the closeness of intercolumniation preserved. Others say that it was omitted because the great breadth of the bottom of the shaft is sufficient to overcome the idea of its sinking into the supporting bed. A late writer in the North British Review considers it absent because, although 'a very 'beautiful feature in itself, and even an harmonious adjunct 'to a style of avowedly less decision and power than the 'Doric, it is impossible not to perceive how vastly the upward 'stream of power in the Doric shaft would be diminished by 'any such interposition between it and the general base-'ment.' *

The principal use of a base is to give the impression that the column has a secure footing, or, which amounts to the same thing, to balance the capital. The great breadth of the lower diameter of the columns in this case satisfies one completely of this security and balance. Another reason which has been assigned is, that the omission of the base helps to connect the columns together by making them seem to grow out of the stylobate, by the unity of which they are inseparably connected together.

The writer in the North British Review, to whom we have already referred, sees in the rapid diminution of the column and in the greatly reduced diameter of the upper part, as compared with that at its base, an expression of concentration of its power immediately under the capital, and this appears to be undoubtedly one of its chief effects.

We come now to the fluting. The nature of the flutes is shewn in the accompanying plate. Their horizontal section was in some cases composed of segments of circles, in others of ellipses. The number was various, in some cases it was 24, generally it was 20, sometimes 16. At Pæstum, the larger hexastyle temple had 24 on the outside columns,

* North British Review, No. xxiv, p. 330.

20 on the lower internal columns, and 16 on the higher internal columns.

The number seems to depend principally on the distance, in comparison to the size of the column, at which it is to be viewed.

The origin and effect of the fluting have given rise to much speculation. Some have supposed the flutes originally intended to hold the spears of those worshipping; others derive them from the streaking caused by rain on the plain cylindrical column; while a third party suppose them to be imitations of the marks on the trunks of trees. Various opinions have more recently been entertained regarding them,—as, for instance, that they were intended to give a rectangular effect to the circular columns; to make more marked the circularity of the columns, by the gradual shading imparted to them, and by the gradual diminution of the surface of successive flutes seen; and, as Müller thinks, to increase the apparent height of the column. Some hold that they were designed to give the effect of lightness without materially injuring the mass of the column. More recently they have been held to have the effect of imparting a vigorous ascending energy to the column; and of expressing a secure self-confinement and concentration of power.

Of the numerous reasons thus given for the flutes, there are two or three unworthy of consideration. But we must recognise among their effects and excellencies, their making the circularity of the column more marked, their producing a gradation of light and shade, and imparting a lively effect to the column. But their principal effect is that I last mentioned, of giving to the column a vigorous, upshooting, concentrated energy directed against the entablature. This they do by repeating the vertical

line frequently and sharply, and thus decidedly directing the eye upwards.

The next thing in the column to be attended to is the deep groove a little way below the ovolo, and properly forming part of the capital. This is formed of one or more narrow grooves, deeply cut into the shaft at the upper part. This also has been the subject of much discussion. It has been supposed by some to be intended to conceal the joint formed by the meeting of the capital and shaft. Others have supposed it to be a mechanical provision made against the liability of stones to crush and splinter at the edges. That this is not the only or chief motive, is shown by this, that in the earliest examples there are three grooves, where one would have sufficed, and also by this, that the same provision, had this been its reason, ought also to have been made at all the joints of the column.

Another reason has been given in the article we have already referred to in the North British Review, namely, that it is intended by the slight interruption it causes on the upward rise of the flutes to prepare the eye for their final termination, and to express more strongly their upward power.

The true effect of this feature seems to be the softening of the transition from the shaft to the capital, by interposing a member partaking of the character of both. A part of the shaft is cut off it by this groove, which in its form, and by its being fluted, retains its connexion with the shaft, at the same time that, by its position and thinness, it becomes connected with the capital. This opinion seems to receive support from this circumstance, that without this necking the capital looks as if deficient of weight and mass.

We now come to the capital, consisting of the hypo-

trachelium or necking, of the echinus with the annulets, and of the abacus.

This is a very beautiful feature of the Doric temple, and most perfectly adapted to its uses and expressive of the purpose it serves.

The column, shooting up as we have described it, bears a massive square member called the abacus, on which rests again the lower member of the entablature. The vigorous shoot of the column distinctly marks its sufficient power to bear the lifeless mass superimposed upon it, but it is necessary that the mass should seem perfectly poised upon it. Now the breadth of the architrave is so great, that, had it rested immediately on the upper diameter of the column, it would have overhung it on both sides, giving an expression of instability, besides a most unpleasant effect of abruptness in the application of the column to the entablature. To form a more apparently secure bed for the architrave the abacus is interposed. This is a square slab, forming the upper member of the capital, and extending slightly beyond the faces of the architrave, in order the more vividly to express its sufficiency, and the secure rest of the entablature upon it. This is the first form in which we find the capital of the Doric column. Still, however, there is an unpleasant effect of want of adaptation, not of the actual form of the column, but of the mode of its application to the mass on which it acts. The abacus is borne up by a sufficient power, but the power is not equally distributed over it, although each part of it is subjected to the same pressure from above. The most obvious way of uniting the shaft and abacus, and of most fully transmitting the power of the shaft to the abacus, and through it to the entablature, is by a curve such as that of the echinus.

The echinus consists of a curve slightly deviating from the straight line, and suddenly turning over under the abacus with a quirk.

With regard to the expression of the echinus a variety of opinions have been entertained.

Some suppose it to indicate the pressure of the entablature: but this I think is by no means its effect. It is indicative of powerful and easy action, of sufficiency for the work it has to perform, of perfect ease under its load, and by no means of oppression or sufferance from weight; while its gentle curve exhibits its power and the ease with which it performs its functions. The sudden quirk where it meets the abacus exhibits this still further; it shows that the abacus does not press too heavily upon it. Another important effect of this quirk is to mark the distinction between the abacus and the echinus. We have in the arrangement of abacus and echinus a beautiful combination of a circle inscribed in a square.

A remarkable feature of the echinus are the annulets or rings formerly pointed out, surrounding it immediately above the flutings. Some have supposed them to be derived from iron hoops originally used for binding the tops of the column in the wooden structure, which some conceive to have been the original type of the temple. Whether this was their origin cannot be now determined. I think a sufficient motive for them is to be found in their expressive value.

Their first effect seems to be to form a distinct and decided commencement for the echinus by a straight band of shadow. The straight line formed by it would not have been formed by the mere natural running out of the flutes. The effect of that would have been to produce an irregular broken line. To form this distinct commencement, *one* of the cuttings of the annulets would not have been sufficient. The strong shadow at the spring of the echinus would have rendered it, if of the depth and dimension now given it, invisible; and, if of any greater depth, it would have made

necessary either a projection from or a deep cutting into the echinus, which would have destroyed its curve.

Kugler thinks the annulets intended to give the same idea of concentration of power as the flutings of the shafts do. This seems to be one of their effects. Another, I think, is that of forming a distinct medium through which the power of the shaft is transmitted to the echinus.

The whole expression of the column, then, is that of a vigorous concentrated power, rising out of the stylobate with great force but perfect ease against the echinus, through the vigorous curve of which its power is conveyed and diffused over the abacus, on which securely rests the mass of the entablature.

3. We next come to the *entablature* or mass borne, against which the force of the column is exerted. It is, as formerly pointed out, composed of three parts.

The architrave is a perfectly plain square beam extending over the abacus, and stretching nearly from column to column. It is massive and lifeless, and forms a firm and secure continuous basement for the upper parts of the entablature. It contrasts strongly with the life and vigour of the column.

Above the architrave, and below the frieze, runs the tænia, separating these two divisions, and producing in the entablature an effect analogous to that produced in the column by the grooves under the necking. It seems also to mark the horizontality of the entablature; and it forms a basement and finishing line for the triglyphs and sculptures in the metopes.

The frieze runs above the tænia, and, as we have seen, is divided into triglyphs and metopes. The triglyphs are most striking and important members of the Greek temple.

A great variety of opinions have been expressed regarding their intention and expression. Some suppose them to be derived from the clusters of upright reeds, alternating with symbols in the frieze cornice of the Egyptians. Many suppose them to represent the notched ends of beams extending from wall to wall. Others have supposed them to be necessary, and intended to contrast with the horizontal lines of the entablature. Mr Patmore, again, the writer in the North British Review, to whose article I have already referred, conceives them, and the drops below, to have a dependent expression, and considers their effect to be by this means to heighten the appearance of weight in the entablature. This he conceives to be their sole effect.

But this does not seem to be the expression of the triglyphs. They are rigid and stiff. Still less is their alleged effect on the entablature to be understood. Moreover, it is not easy to reconcile this author's account with the fact, that in the older temples the spaces between the triglyphs were left open, and filled up only at a later period. This filling up he attributes to a desire to do away with an appearance the triglyphs must have had of seeming to support the cornice, an appearance ruinous, as he confesses, to the all-important effect of simple depension.

The actual effects of the triglyphs seem to be these,—they make more marked by contrast the horizontality of the entablature; they serve as frames to the sculpture in the metopes; and by their rigidity they heighten the expression of life in these sculptures. Moreover, they with the metopes give to the architrave its passive lifeless effect by contrast with their own uprightness and life; and they show reflexly the adequacy of the columns for their work by their own expression of security and ease.

It has been remarked that when triglyphs are omitted

the entablature seems lighter than when they are present. The reason is that when they are absent the effect of horizontality in the entablature is diminished. An expression of shooting upwards, of verticality, is the best expression of life and vigour. The mere absence of that is not such a perfect expression of weight as is the presence of its opposite quality, namely, horizontality, and this is given to the architrave by contrast with the triglyphs. Below the triglyph there hang from the tænia certain small members, the regulæ, composed of small fillets filled with drops hanging beneath, called the guttæ. These drops have a markedly depending effect. This has been always felt, and hence the accounts which attribute them to the imitation of drops of rain that have run down the triglyph. The guttæ have been accounted for otherwise. Some suppose them intended to soften the abrupt transition otherwise occurring between the highly decorated frieze and the perfectly plain architrave. Others, again, suppose them to represent heads of nails, while some conceive them intended to give an increased expression of weight to the entablature. This they clearly do.

The cornice constitutes the third great division of the entablature. Its function is that of a completing, covering, and terminating member, and of this it is amply expressive. It is weighty, pendant, and manifestly unfitted for carrying anything above it.

Its effects are produced by several means. The first is its own slope forwards. This has been attempted to be accounted for in various ways. One account supposes it to be intended to appear as the continuation of the slope of the roof. But it does not continue this slope. Another considers it intended to counteract the effect which it is alleged that cornices projecting at right angles from their supporting wall have, of seeming to form an obtuse angle with the

wall, and to produce the effect of a right angle. But it does not do this. The angle it forms is at once perceived to be an acute angle. Its downward slope is distinctly appreciable. It is intended, I think, to give it an impending and finishing effect. The second thing affecting its expression are the mutules, which, appearing like heavy slabs hanging from it, greatly heighten the apparent weight of the whole, while they reflexly show the power of the cornice in its ability to sustain them. The drops under the mutules are a remarkable feature in the cornice. They seem to serve these ends—to keep up the rich effect of the upper parts of the entablature, and at the same time to increase the expression of weight in the whole. By their being placed in rows, they help to mark the horizontality of the entablature. Papworth supposes them intended to break up or confuse the edge of the shadow cast on the frieze, whose edge, if straight, would have cut the sculpture by a straight line. This, however, can apply only to the exterior row of them.

The crowning member of the cornice consists of a moulding carrying a thin slab, which gives a finished termination to the plate of the corona.

The whole entablature, then, is a massive markedly horizontal and inorganic body. The architrave, resting on the columns, serves as a distinct and secure basement to the whole. The cornice is a decided termination. Between them is the frieze, bearing a mass of life in the metopes. It rests with perfect security and ease on the architrave, whose firm poise it makes evident by the conscious security of its living sculptures. It is relieved of the weight of the cornice by the triglyphs, which at once make more marked the horizontal lines of the whole entablature, and connect together its bearing and crowning parts.

4. We now come to the *pediment* and *roof*. The pediment is the termination of the roof. Its height was generally about one-eighth of its breadth. It was formed by carrying along the slope of the roof the corona and cymatium, which were crowned by a large moulding called the cyma, and formed the framework of the sculpture. At the top and at the angles were placed square slabs, which bore light aspiring ornaments. The whole expression of the pediment was one of dignity and elevation. This arose at once from its general form—from the splendid sculptures which adorned it—from the form of the finishing moulding of the cyma—and from the light ornaments surmounting it.

The antæ are nothing more than the facings of the walls —mere finishings, and never placed in rows. They have no entasis or slope except the slight one they have in common with the walls. To contradict any idea of their being intended as bearers, further than the walls are so, their depth is generally only about half their breadth on the face.

The value of the wall and of its terminations in the general effect, arises from their heightening by contrast the effect of the columns, and their affording a back-ground against which the columns distinctly stand out, and on which their deep unbroken shadows fall, contributing most materially to the effect of repose, which is the most striking expression of these temples.

We have then in the Greek Doric temple the stylobate, affording a firm secure grand base for the whole, connecting it firmly at its ends, and strongly expressive of stability. We have next the columns, vigorously springing from this base to the architrave, the fluting and gradual diminution expressing a concentration of power, becoming more intense

as it reaches the point on which it acts. We have the annuli binding these together, and transmitting their power into the echinus, which rises, with its powerful and easy curve, against the abacus. The abacus seems to distribute the force of the column equally on the entablature, while, by its breadth, it manifests itself a secure rest for the architrave. We have next the architrave—a plain, inorganic, lifeless mass—resting on these vigorous upshooting columns, and with the parts above it accounting for the power exerted. Over it we have the sculpture-bearing frieze, full of life, as if conscious of the security afforded it by the architrave below, with its vertical triglyphs marking the horizontality and deadness of the architrave, and by their rigidity heightening the life of the sculptures to which they serve as framework. We have next the cornice, decidedly finishing the whole composition, repeating strongly the expression of horizontality, and bearing ornaments below it, which at once give it weight, and enrich the whole upper part of the building; and we have behind the columns the walls, which, as a back-ground, strongly relieve the principal members of the building, and give to each its utmost possible effect.

The whole expression of the temple is one of completeness, and of perfect and dignified repose.

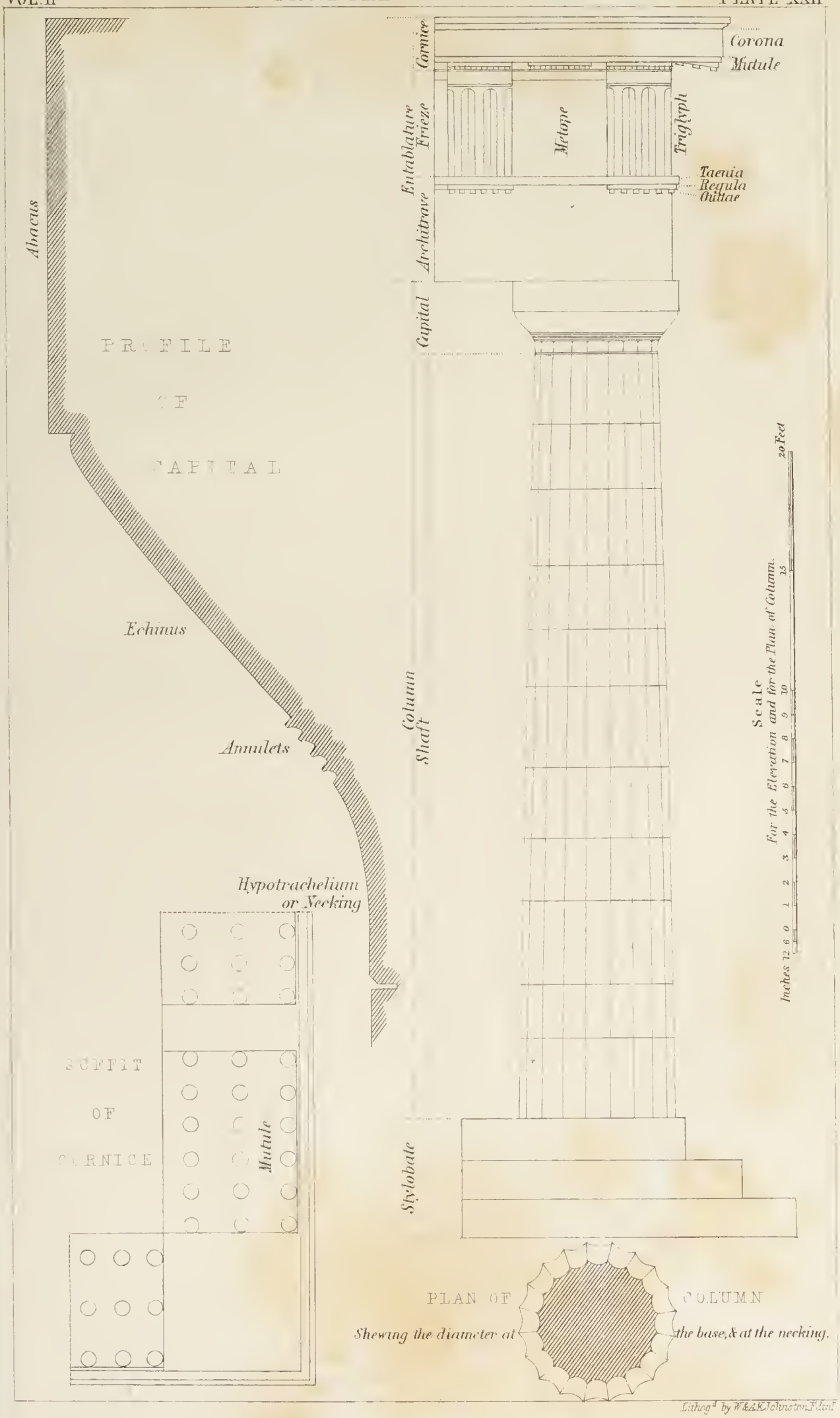
Such is a hurried and general account of the forms and expression of the members of the Doric Temple. In the second part of this paper I shall enter upon what is more especially its subject, namely, an examination into the principles on which these elements are associated together.

END OF VOL. II.

# THE DORIC ORDER.

FROM THE PARTHENON.






Lithog^d by W. & A. K. Johnston, F.R.G.S.

## ERRATA.

At page 253, in the author's designation delete the word 'Architect.'

At page 261, 6th line, with reference to the allusion by Mr Smith to a Report by Mr Charles Wilson, it will be observed, on referring to the Transactions, that the Report referred to was prepared by a Committee of Architects, Fellows of the Institute, in Glasgow.

The numbering of the Plates illustrative of Mr Purdie's Paper, instead of being 1, 2, 3. 4, 5, 6, 7, and 8, should be 13, 14, 15, 16, 17, 18, 19, 20.

# APPENDIX.

# SECOND ANNUAL REPORT

OF THE

# COUNCIL OF MANAGEMENT.

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At the commencement of this, the Second Session of the Architectural Institute of Scotland, the Council of Management, in terms of Law XIV. of the Constitution, have again to submit to the Annual General Meeting of the Members a Report of their past proceedings, and of the present position of the Institute and its affairs.

In discharging this duty, it will be necessary for them in the first instance to recapitulate briefly the various points which have been already brought under the notice of the Institute by the Secretary in his Occasional Report, which was read at the meeting of 27th March last.

It appeared from that Report that at the close of its first session the Institute had enrolled 267 members in various parts of the country, thus affording strong evidence of the interest with which the study of Architecture is now beginning to be regarded throughout Scotland generally, and of the seasonable appearance of a Scottish Institute to encourage the cultivation of this art, and to elevate the profession and direct the public taste.

The first volume of the Transactions of the Institute is now completed, and in the hands of all the members. It

comprises papers of great interest upon a variety of subjects connected with the history and practice of Architecture, and the kindred branches of art; and the Council refer with confidence to the volume itself as evidence of the care with which the printing and other arrangements have been superintended by the committee appointed for that purpose. The following is a list of the contributions, with the names of the authors:—

I. The Inaugural Address, by the Reverend Dr Grant of St Mary's.

II. On the Method by which the Members generally may practically follow out the Architectural purposes of the Institute—By the Very Reverend E. B. Ramsay, F.R.S.E.

III. What will it cost?—By David Cousin, Esq., Architect, F.A.I.S.

IV. Notes on Early Scottish Architects—By Joseph Robertson, Esq.

V. On Ornamental Art as applicable to the internal decoration of Houses—By James Ballantine, Esq.

VI. Remarks on Cottages for Rural Districts—By Patrick Wilson, Esq., Architect, F.A.I.S.

VII. Address at the opening Meeting of the Institute in Glasgow—By Archibald Alison, Esq., LL.D., Sheriff of Lanarkshire.

VIII. Remarks on the Architecture of Towns—By Patrick Wilson, Esq., Architect, F.A.I.S.

IX. On the Architectural Features of Edinburgh—By J. Dick Peddie, Esq., Architect, F.A.I.S.

X. Cities and Architects—By James Salmon, Esq., Architect, F.A.I.S.

XI. On Scottish Architecture in relation to its Scenery—By William Clarke, Esq., Architect, F.A.I.S.

XII. On Ventilation and Warming of Buildings, and Heating of Baths, as practised by the Ancients—By Robert Ritchie, Esq., A.I.C.E.

XIII. On the Geometric Principle of Beauty in the Mouldings of Ancient Grecian Architecture—By D. R. Hay, Esq.

The Secretary is now engaged, under the authority of the Council, in transmitting copies of these Transactions to several of the institutions connected with art both in this country and abroad; and the Council willingly avail themselves of this opportunity to express their gratitude to the authors of these able and instructive contributions, through whose exertions the Institute has been enabled in this department fully to realise the wishes of its promoters.

The Council have had under their consideration the manner which has been adopted of printing and circulating the Transactions; and they are still of opinion, more especially for the sake of the numerous body of subscribers resident in the country, that the present system of full reports and periodical circulation should be continued.

In addition to the papers which have been printed in the Transactions, there have been various short communications and exhibitions of designs, plans, &c., a kind of contribution to the business of the Institute which the Council are very anxious to encourage; and they hope that the professional members especially will not hesitate to bring forward any point of practice which they may think deserving of consideration or inquiry.

With reference to the excursions and extra meetings which the Council were empowered by the Institute to appoint during vacation in Aberdeen, Perth, or other places to be named by them, they deem it their duty to explain that the fact of no such meetings having been yet held, is to be attributed not to any want of due exertion on their part, but to a cause which they believe has been found to operate very generally all over the country in withdrawing public attention from such enterprizes; they allude to the all-absorbing attractions of the Great Exhibition of Industry of all Nations, which has proved, during the past summer and autumn, the

one grand excursion for the whole provincial population. The Council, however, beg to express their thanks for the assistance which was rendered to the Secretary by Mr Sawers, Provost of Stirling, Mr Andrew Liddell, Plean House, and Mr Graham of Leitchtown, and also by Messrs Forbes, Irvine, W. B. Ferguson, and Blaikie of Aberdeen, in the efforts which were made to arrange meetings of the Institute in Stirling and Aberdeen. At the same time they are happy to state that arrangements are now in progress for holding a meeting of the Institute in Aberdeen in January next.

Since the termination of last Session, the Council have received a communication from the Directors of the Royal Association of Contributors to the National Monument, requesting the advice and coöperation of the Institute in the endeavours of the Directors to advance with the work committed to their care. The Council cordially entertained this communication; and they have appointed a committee to consider in what way the Institute can best meet the wishes of the Directors.

The Council have also, in virtue of the powers committed to them by the Institute, appointed committees for the purpose of collecting evidence as to the architect of George Heriot's Hospital, and for investigating the theory contained in Mr D. R. Hay's paper, on the subject of the Geometric Principles of Beauty in the Mouldings of Ancient Grecian Architecture. These committees are now engaged in prosecuting inquiries which promise to lead to very interesting results.

The Council refer with pleasure to the accounts of the income and expenditure of the Institute, which have been certified by the Auditors, and are embodied in the Treasurer's Report, now laid upon the table.

In regard to these accounts, it will be remembered that

although the Institute was constituted *ad interim* on 3d December 1849, a resolution was afterwards adopted at the General Meeting held on 17th April 1850, whereby it was provided that no subscription should be payable by the Members until November thereafter, being the subscription for the Session 1850-51. It thus became necessary that the entire expenditure of two years should become chargeable upon the income of one. It will be observed, however, that notwithstanding this arrangement, and the great outlay necessarily incurred in carrying out the initiatory proceedings connected with the establishment of such an Institution, there is a balance remaining at the credit of the Institute upon the annual accounts of £83 : 19 : 5.

## THE CHAIR OF ARCHITECTURE.

The Council have resolved that £15 of the sum in the Treasurer's hands be applied towards the endowment of the Architectural Chair; and in recommending that the scheme for carrying out this most important object of the Institute should now be opened, they would strongly urge its claims upon the consideration of all who are interested in the advancement of Architectural Science in Scotland. They have accordingly appointed a Committee to receive contributions, and generally to superintend the arrangements connected with the proposed endowment.

## THE LIBRARY, READING ROOM, AND MUSEUM.

The Council have resolved that a like sum of £15 should be applied towards the formation of this very necessary and

important department. In the donations which have been made to the Institute this evening, the work of collection may be considered as having commenced; and the Council trust that through the liberality of the members, the number of Volumes, and also of Drawings, Maps, and Models, thus brought within easy access of all, will be rapidly increased.

## PREMISES.

Of all the schemes to which the Council have alluded in this Report, the providing of premises is that to which the most immediate attention of the members should be called. It is quite evident that with the rapidly increasing business of the Institution, its numerous committees, and its library and museum, already in course of formation, it will be indispensable to the proper management of its affairs that suitable accommodation should be immediately provided. Meantime the Council have appropriated a sum of £15 towards the formation of a fund for this purpose.

The Council have appointed committees to receive contributions, and generally to superintend the arrangements connected with these various schemes, which, with the other committees appointed by them, will be found at the end of this Report.

The Council, in concluding this statement, are happy to be able to congratulate the members upon the prosperous state of the Institute, and upon the growing interest, attributable they believe in a great measure to its influences, which seems already to prevail throughout the country on matters connected with Architecture and the relative arts. The subject itself in its higher departments is of so comprehensive a

character, and embraces such a wide and diversified field of study and inquiry, that it cannot be matter of surprise if, when facilities such as this institution offers are afforded, it should rapidly engage the attention of minds of every variety of taste and habit of thought. Neither is this interest confined alone to the man of science and the man of taste. Architecture, in its more familiar aspects, appeals to the philanthropist in the resources which it offers for the cultivation of the social and domestic virtues through the improvement of the homes of the people. And in one view it cannot fail to have a charm for all. For, as in other days, the patriotic fervour of the Roman soldier was kindled by the heart-stirring watchword which called to mind his family altar and his household gods; so in these better days of peace, and especially in this favoured land, where the relationships of private life are held so dear, there are few indeed who will not feel the force of the sentiment so well given by Sir Henry Wotton, where he says,—'Every man's proper mansion-house and home, being 'the theatre of his hospitalitie, the seat of self-fruition, the 'comfortablest part of his own life, the noblest of his sonne's 'inheritance, a kind of private princedom, nay, to the pos-'sessors thereof, an epitome of the whole world, may well 'deserve by these attributes, according to the degree of the 'master, to be decently and delightfully adorned.'

In and by authority of the Council of Management,

W. A PARKER, *Hon. Sec.*

# LIST OF COMMITTEES.

## Committee on the Scheme for Endowing a Chair of Architecture.

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James Lorimer, Esq., *Convener.*

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The Secretary and Treasurer are Members of the above Committees.

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OF THE

# ARCHITECTURAL INSTITUTE OF SCOTLAND

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100 Guild, James Wyllie, 59 St Vincent Street, Glasgow.

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Henderson, William, builder, Aberdeen.

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165 M'Clure, John, Buchanan Street, Glasgow.
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170 M'Lelland, Archibald, 66 Howard Street, Glasgow.
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180 Murray, William, of Henderland, Edinburgh.

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190 Paterson, Geo., builder, 14 Montgomery St., Edinburgh.
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195 Purdie, Thomas, 60 Hanover Street, Edinburgh.

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200 Ramsay, Robert, 89 St Vincent Street, Glasgow,
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Ramsay, the Very Rev. Edward B., Edinburgh.
205 Reid, C. G., W.S., Edinburgh.
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Rosebery, the Right Honourable the Earl of.
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210 Ritchie, Robert, Assoc. Inst., C.E.,
Ritchie, Walter, 37 Tolbooth Wynd, Leith.
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Robertson, Joseph, Edinburgh.
215 Rochead, J. T., architect, Glasgow.
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Ruskin, John, Denmark Hill, London.
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Rutherglen, Andrew, 4 India Street, Glasgow.

220 Salmon, James, architect, Glasgow.
Sands, Archibald, surveyor, 105 Hill Street, Glasgow.
Scarth, Pillans, W.S., Leith.
Scott, Archibald, architect, Edinburgh.
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225 Scott, John, builder, Milngavie.
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Smith, Alex., surveyor, Union Street, Aberdeen.
230 Smith, George, architect, Edinburgh.
Smith, James, architect, Edinburgh.
Smith, James, architect, Glasgow.
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235 Spence, William, architect, Glasgow.
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245 Taylor, John, 109 Princes Street, Edinburgh.
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Trower, Right Reverend W. J., Bishop of Glasgow.
250 Tweedie, Rev. W. K., 15 George Square, Edinburgh.

Veitch, Rev. James, of St Cuthbert's, Edinburgh.

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Wilkie, James, accountant, Edinburgh.
255 Wilson, Richard, 23 Rutland Street, Edinburgh.
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Wilson, Patrick, architect, Edinburgh.
260 Wright, Robert, architect, Edinburgh.
Wylie, Henry J., C.E., 5 Bellevue Terrace, Edinburgh.

York, W., Deacon Convener, Trades' House, Glasgow.
263 Young, Archibald, advocate, Edinburgh.

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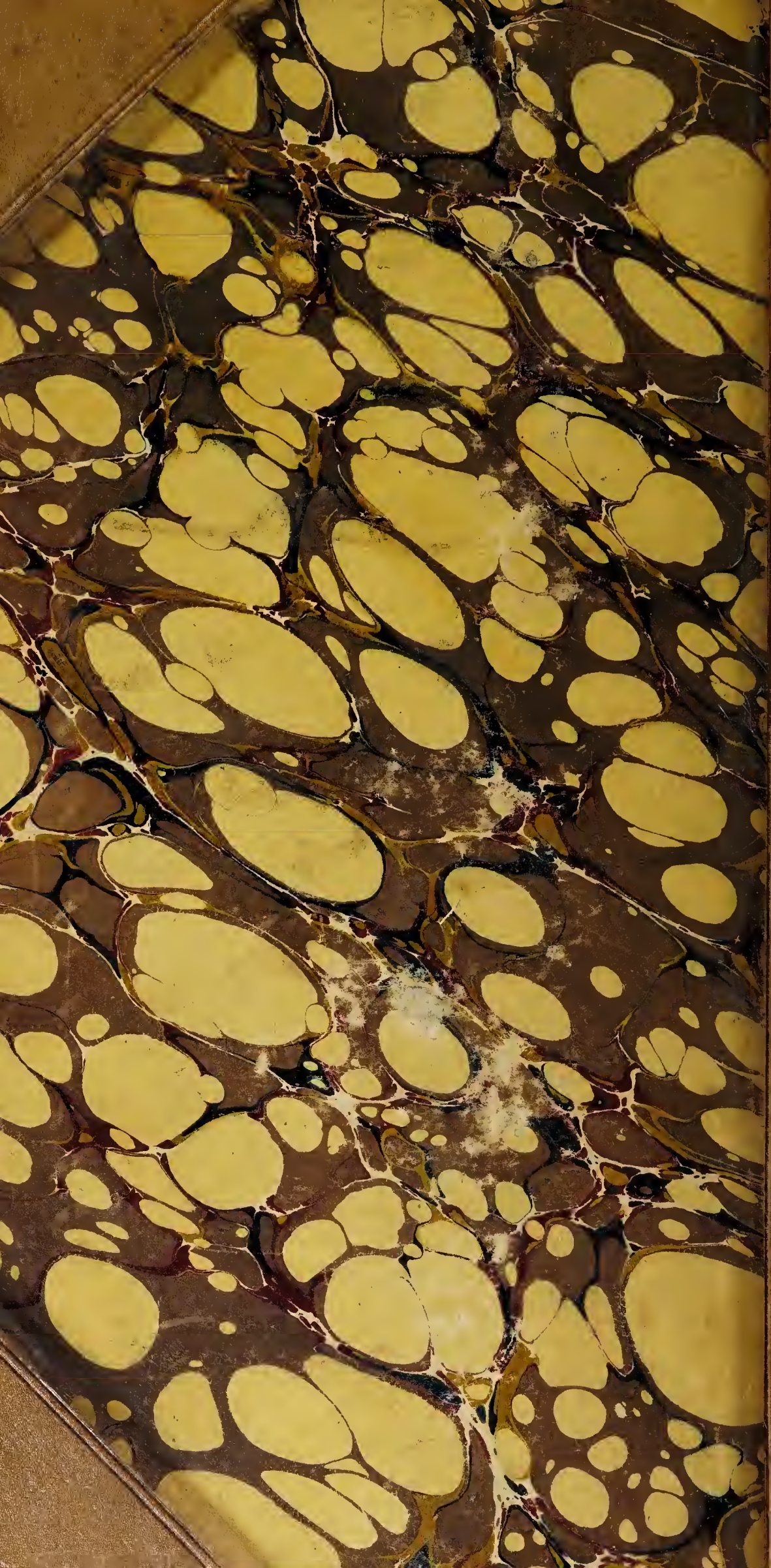
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